Panasonic

VHS-C Movie Camera

NV-A3B

Operating Instructions

VHS C PAL

Basic Operations 3~

Advanced Operations 26~

Options/ Editing 34~

Miscellaneous/ Care of Unit 38~

Index 48~

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT5932

Dear Customer, We would like to take this opportunity to thank you for purchasing this Panasonic Movie Camera.
Please read these Operating Instructions carefully and keep them handy for future reference.

Information for Your Safety

IMPORTANT
YOUR ATTENTION IS DRAWN TO THE FACT THAT RECORDING OF PRE-RECORDED TAPES OR DISCS OR OTHER PUBLISHED OR BROADCAST MATERIAL MAY INFRINGE COPYRIGHT LAWS.

WARNING
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION
TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

FOR YOUR SAFETY
■ DO NOT REMOVE THE OUTER COVER.
To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

Caution for AC mains lead

For your safety, please read the following text carefully.

This appliance is supplied with a moulded three-pin mains plug for your safety and convenience.
A 5-ampere fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amperes and it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark ⟡ or the BSI mark ♈ on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover, the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13-AMPERE SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt, please consult a qualified electrician.

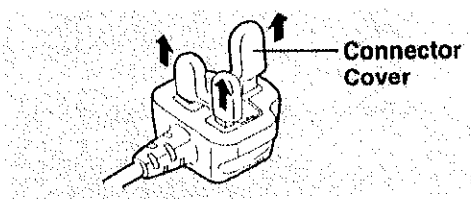
■ IMPORTANT
The wires in this mains lead are coloured in accordance with the following code:
Blue: Neutral
Brown: Live
As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

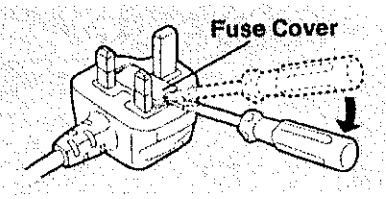
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstances should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚ .

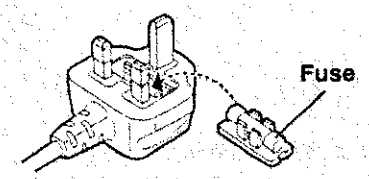
■ Before use
Remove the Connector Cover as follows.



■ How to replace the Fuse
1. Remove the Fuse Cover with a screwdriver.



2. Replace the fuse and attach the Fuse Cover.



Contents

Basic Operations

Check List for the Standard Accessories 3
Controls and Functions 4
Using the AC Adaptor as Power Supply Unit ***6***
Watching the Picture on a TV Set 6
Charging the Battery Pack ***8***
Attaching the Charged Battery Pack 8
Powering the Movie Camera ON/OFF ***10***
Inserting a Video Cassette 10
Adjusting the Viewfinder 10
Setting the Date and Time ***12***
Inserting and Deleting the Date and Time 12
Starting Filming (Recording) ***14***
Making the Subject Larger or Smaller During Filming (Zooming) 14
Using the Tape Counter Indication 16
Using the Memory Function 16
Confirming the Remaining Tape Time 16
Quick Reference Guide to the Indications in the Viewfinder 18
Playing Back on the Viewfinder or a TV ***22***
Rewinding or Fast-Forwarding the Tape 22
Using the Cue, Review and Still Playback Functions During Normal Playback 22
Playing Back on a VTR, Using the Supplied Cassette Adaptor ***24***

Advanced Operations

Filming in the Auto Focus Mode 26
Filming in the Manual Focus Mode 26
Filming Fast-Moving Subjects 28
Making Subjects Stand out Sharply from the Background 28
Filming Dark Scenes More Brightly 28
Checking the End of a Recorded Scene 30
Locating a Point Where You Wish to Add a New Scene 30
Eliminating Picture Distortions by Adjusting the Tracking 30
White Balance Adjustment 32
Colour Temperature and White Balance 32
Lighting 33
Standard Values of Brightness 33

Options/Editing

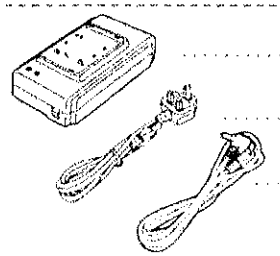
Using the Car Battery Cord (Optional) 34
Playing back on a TV Set with 21-pin Scart Terminal 34
Editing a Previously Recorded Tape 35
Optional Accessories 37

Miscellaneous/Care of Unit

Adjusting the Length of the Grip Belt 38
Attaching the Shoulder Strap 38
Storage 38
Cleaning the Viewfinder 39
Preventing Accidental Erasure of Recordings 39
Before Requesting Service 40
Cautions 42
Condensation 42
Questions & Answers 43
Index 48
Specifications 50

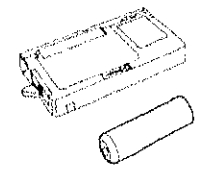
Check List for the Standard Accessories

AC Adaptor Set



AC Adaptor (VSK0317)
Mains Cable (VJA0733)
DC Input Cable (VJA0769)

Battery Pack (VSB0200)



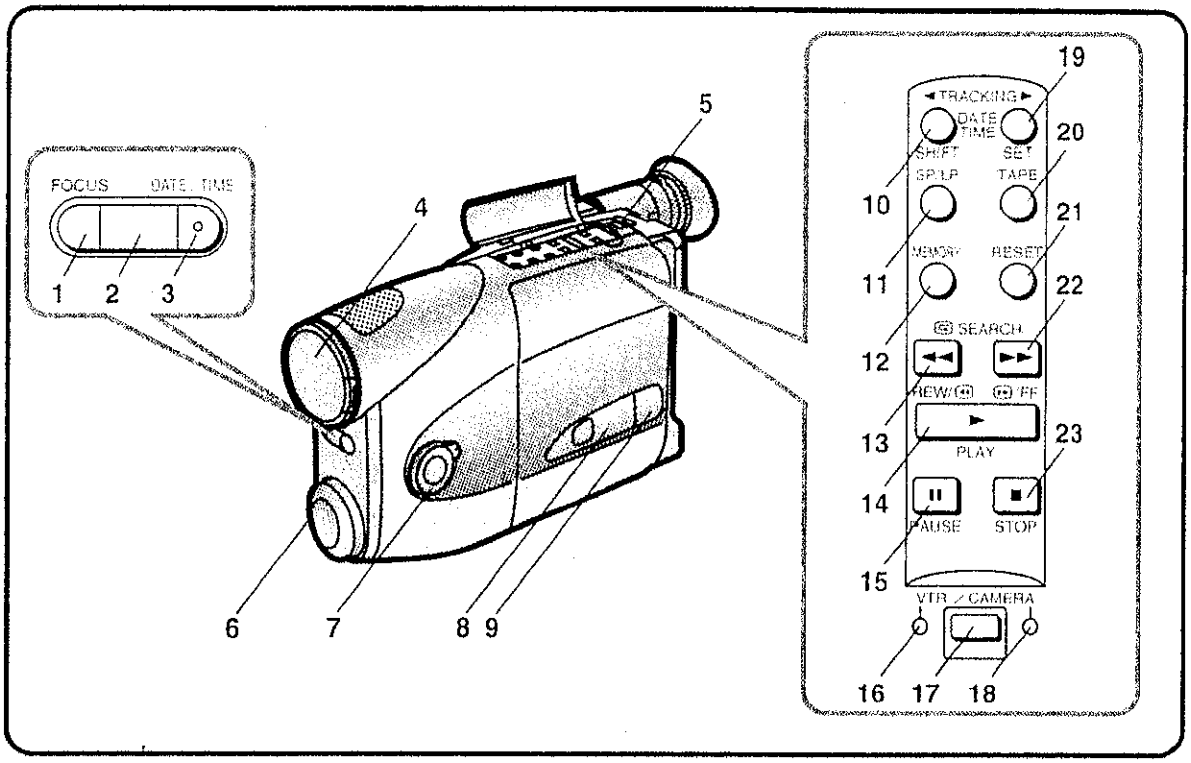
Cassette Adaptor (VW-TCA7E)
Battery (R6)

Shoulder Strap (VFC1830)

- When purchasing an additional AC Adaptor, order model number VW-AS4E.
- For Purchasing additional Battery Packs, see the list of optional accessories on p. 37.

Controls and Functions

For more details, see the pages indicated in brackets.



1 **[FOCUS] Button (p. 26)**

2 **Infra-Red Sensor**
Be careful not to cover the Infra-Red Sensor with your hand, etc. during filming.

3 **[DATE/TIME] Button (p. 12)**

4 **Lens Cap (p. 10)**

5 **[▲ EJECT] Lever (p. 10)**

6 **Focus Ring (p. 26)**

7 **[AE] Selector (p. 15, 26, 28)**
Use this selector to set the desired AE mode.

8 **Cassette Compartment**

9 **Cassette Compartment [LOCK] Button (p. 11)**

10 **[DATE/TIME/SHIFT • ◄ TRACKING] Button (p. 12, 30)**
Press this button to adjust the tracking in order to eliminate distortions in the playback picture (p. 30), or press it to advance to the next item during the setting of the date and time (p. 12).

11 **[SP/LP] Button (p. 14)**

12 **[MEMORY] Button (p. 16)**

13 **[REW/◄◄] Button (p. 22, 30)**
Use this Button:
- Recording Review
- Review
- REW (Rewind)
- Camera Search

14 **[PLAY] Button (p. 23)**

15 **[PAUSE] Button (p. 23)**

16 **"VTR" Indication Lamp (p. 22)**

17 **[VTR/CAMERA] Button (p. 22)**
Press this Button to select the "VTR" Mode for playback or the "CAMERA" Mode for filming.

18 **"CAMERA" Indication Lamp (p. 14)**

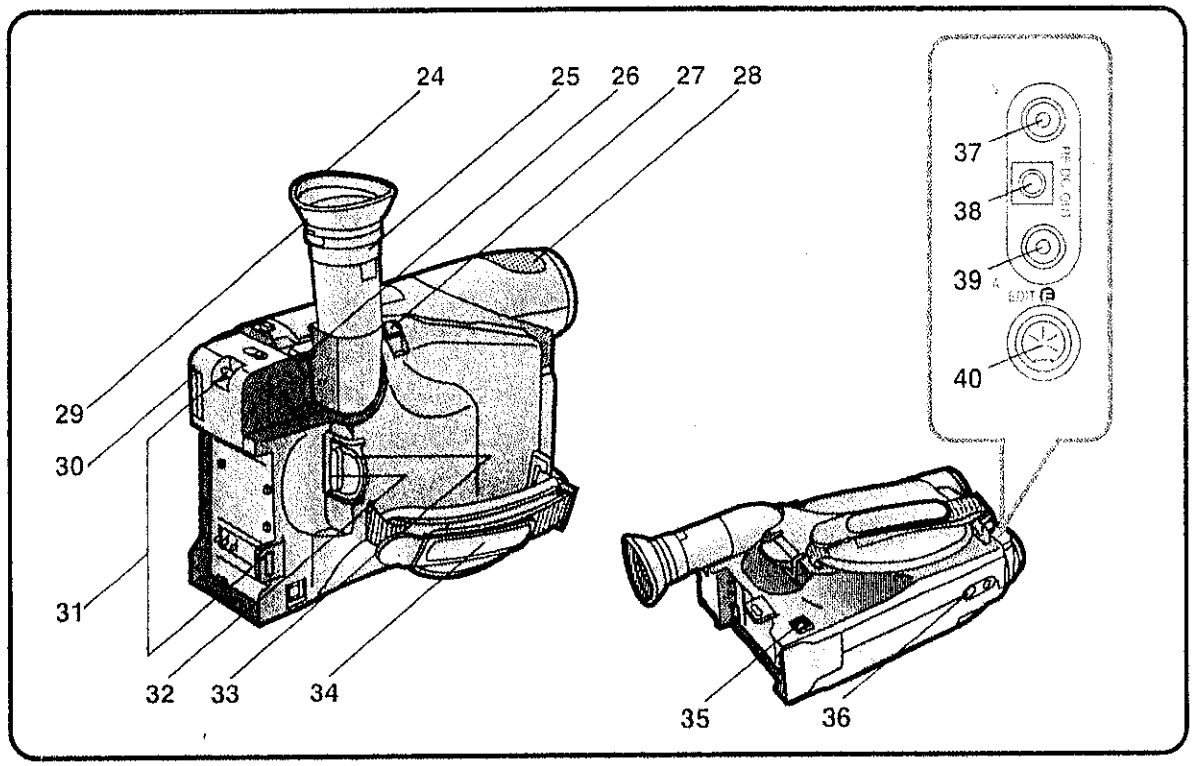
19 **[DATE/TIME/SET • TRACKING ►] Button (p. 12, 30)**
Press this button to adjust the tracking in order to eliminate distortions in the playback picture (p. 30), or press it to set the correct date and time (p. 12).

20 **[TAPE] Button (p. 16)**

21 **[RESET] Button (p. 16)**

22 **[►►/FF] Button (p. 22, 31)**
Use this Button:
- Cue
- FF (Fast-Forwarding)
- Camera Search

23 **[STOP] Button (p. 23)**



24 Eyecup (p. 39)

25 Eyepiece Corrector Ring (p. 11)

26 Dew Sensor Slot
Through this slot, the Movie Camera detects condensation. Take care not to let this slot get clogged with dirt and not to cover it with your fingers, etc.

27 [W • T] Zoom Lever (p. 14)

28 Microphone

29 Viewfinder (p. 18)

30 [BATTERY EJECT] Button (p. 9)

31 Shoulder Strap Holders (p. 38)

32 Filming Start/Stop Button (Red) (p. 14)

33 [POWER] ON/OFF Switch (p. 10)

34 Grip Belt (p. 38)

35 [DC IN] Socket (p. 6)

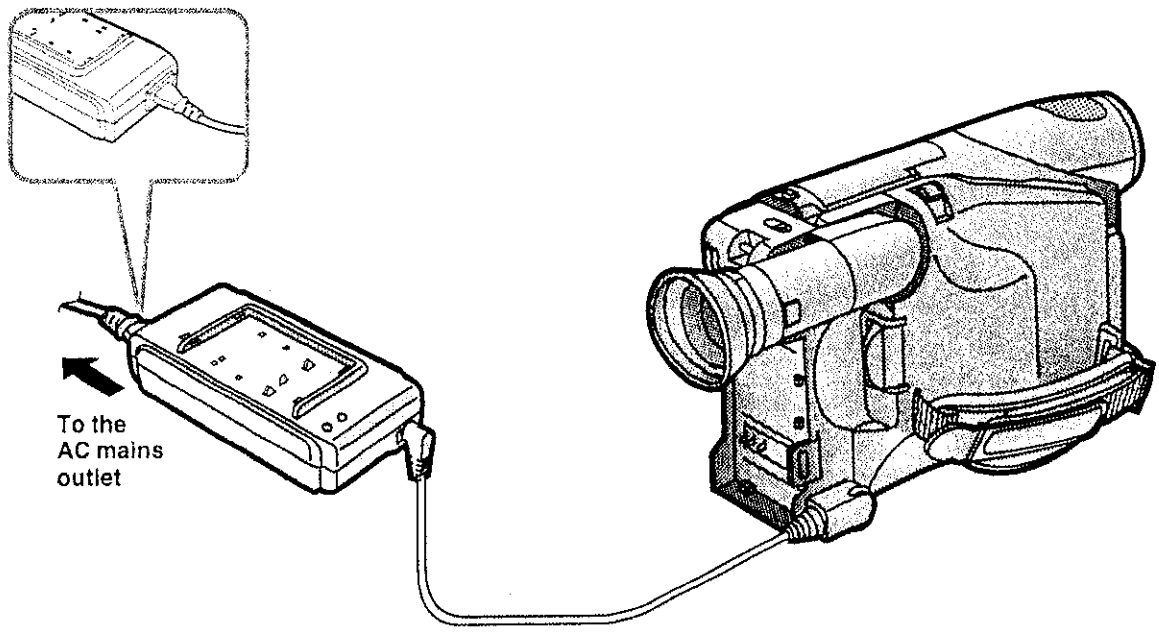
36 Tripod Receptacle
Attach a tripod (optional) to this receptacle.

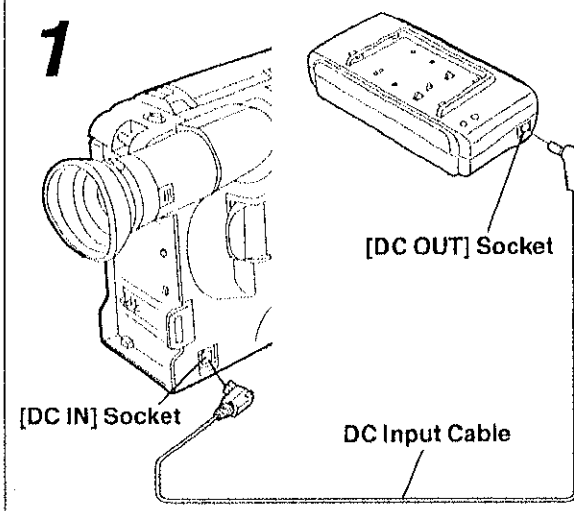
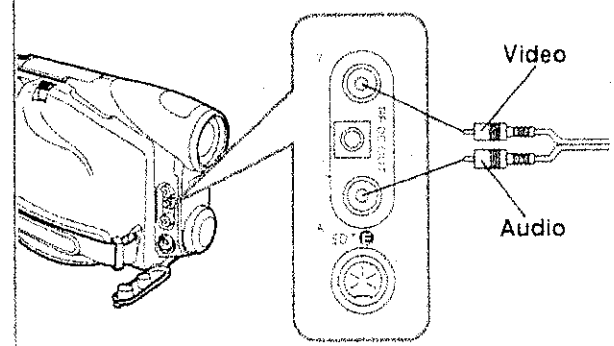
37 [VIDEO OUT] Socket (p. 6)

38 [RF DC OUT] Socket
To playback via a TV Set without AV Input Socket, connect this Socket to the RF IN Socket of the TV Set using an RF Adaptor (optional).

39 [AUDIO OUT] Socket (p. 6)

40 [EDIT] Socket (p. 32)



Title	Procedure
Using the AC Adaptor as Power Supply Unit If you want to use the Movie Camera with the Battery Pack, it is necessary to charge the Battery Pack first. (p. 8)	**1** 
Watching the Picture on a TV Set (Using the Audio/Video Cable) Connect after turning off the Movie Camera and the TV Set.	**1**  Connect the Movie Camera to the TV set.

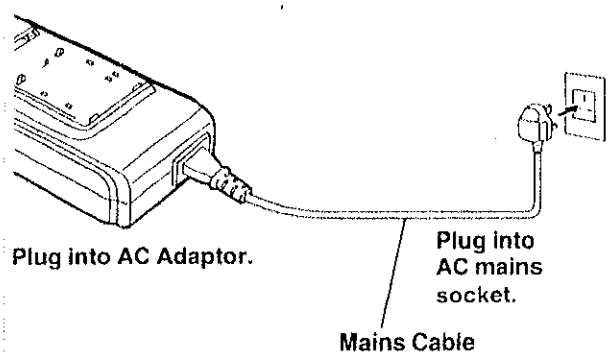
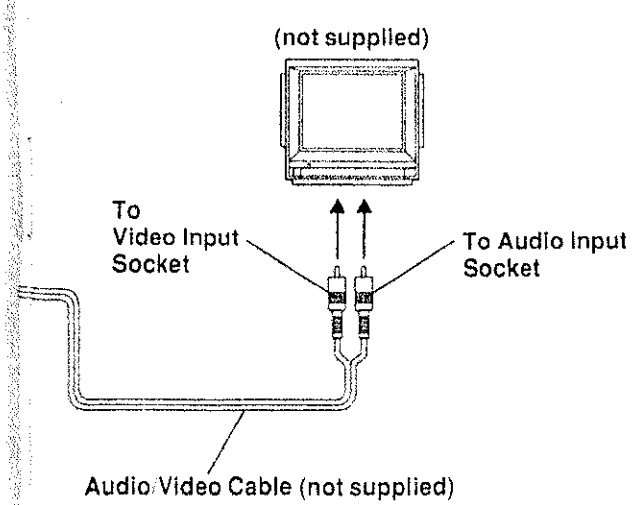
Cautions for the AC Adaptor

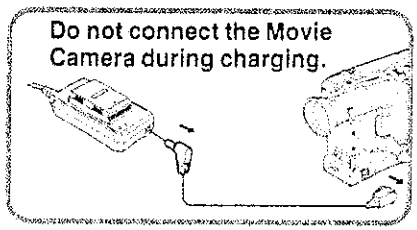
■ Cautions for Use

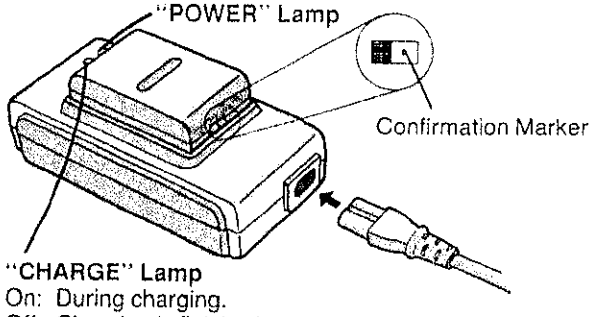
- This AC Adaptor works on any mains supply voltage between 100 and 240 V. and any frequency between 50 and 60 Hz. For use in other countries, an adaptor plug may be necessary.
- Do not handle the AC Adaptor with wet hands.

■ Caution for Cleaning

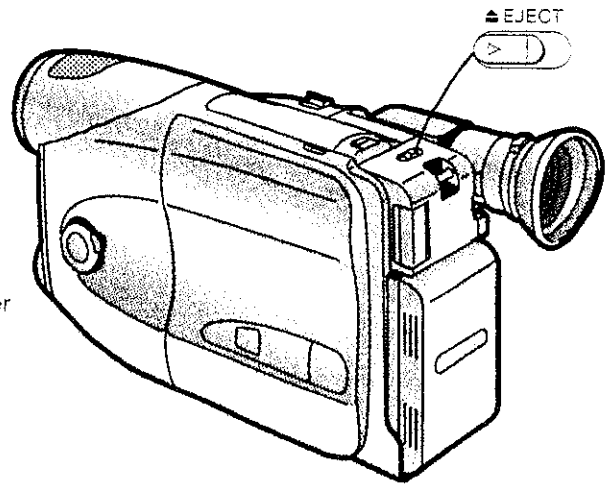
Before cleaning the AC Adaptor, make sure that it is disconnected from the AC mains socket.

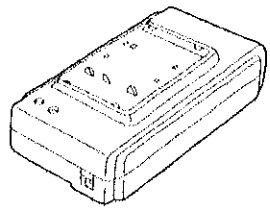
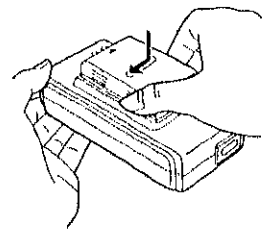
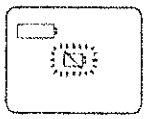
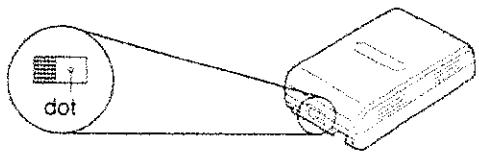
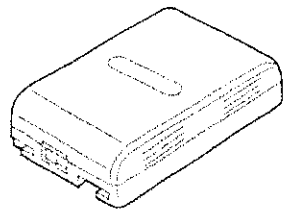
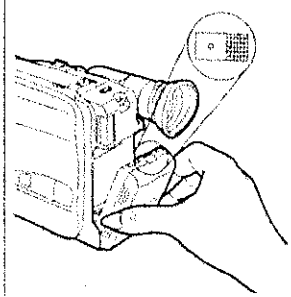
	Remarks, etc.
2  	• When the AC Adaptor is used to supply the Movie Camera with power, remove the Battery Pack from the AC Adaptor as it cannot charge the Battery Pack and provide power simultaneously. • Do not use the AC Adaptor for any purposes other than supplying the unit with power or charging the Battery Pack. • When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio farther away from the AC Adaptor. • When not using the AC Adaptor, unplug its mains cable from the AC mains socket. To unplug, pull it by the plug, not by the cable.
 	• If your TV set is not equipped with an AV Input Socket, the RF Adaptor (optional) is necessary. For its connection, read the operating instructions of the RF Adaptor (VW-RF7E). • If you want to connect the Movie Camera to a TV set with a 21-pin Scart Terminal, see p. 34.





"CHARGE" Lamp
On: During charging.
Off: Charging is finished.
(For maximum charge, continue charging for 2 hours after the "CHARGE" Lamp has gone off.)



Title	Procedure	
Charging the Battery Pack •Be sure to insert the mains plug completely into the correct socket. •Do not connect the DC Input Cable to the AC Adaptor otherwise the Battery Pack cannot be charged.		**1**  Attach the Battery Pack.
Attaching the Charged Battery Pack  If an exhausted Battery Pack is attached, the " ▭ " Indication in the Viewfinder flashes, when you turn the Movie Camera on. **Charge Confirmation Marker** Use this marker to distinguish between charged and discharged Battery Packs. For example, slide the Button so that the dot is visible after charging is completed. 		**1**  **Attach the Battery Pack with its Charge Confirmation Marker facing upward.**

Cautions for Use

- If you want to improve the charge of a Battery Pack whose operation time has become too short for practical use or which has been stored for a long time, continue charging for 24 hours even after the "CHARGE" Lamp on the AC Adaptor goes out.
  (If this does not result in an operation time close to those shown in the table, the service life of this Battery Pack has reached its end. Replace it with a new one.)
- Do not try to disassemble or reconstruct the Battery Pack.
- Do not throw the exhausted Battery Pack into a fire.
- Make sure that no metal objects touch the contacts of the Battery Pack.
- Do not charge the Battery Pack again when it is already fully charged.
- During filming or during charging, the Battery Pack may become warm, this is normal and not a malfunction.

2

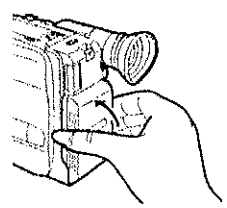
Plug into AC Adaptor. Plug into AC mains socket.

Mains Cable

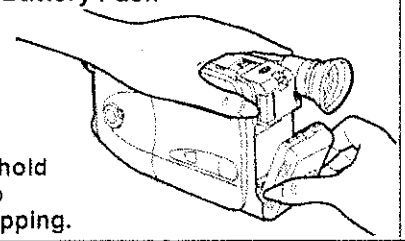
■ Removing the Battery Pack

Slide it in the opposite direction to step 1.

2



■ Removing the Battery Pack

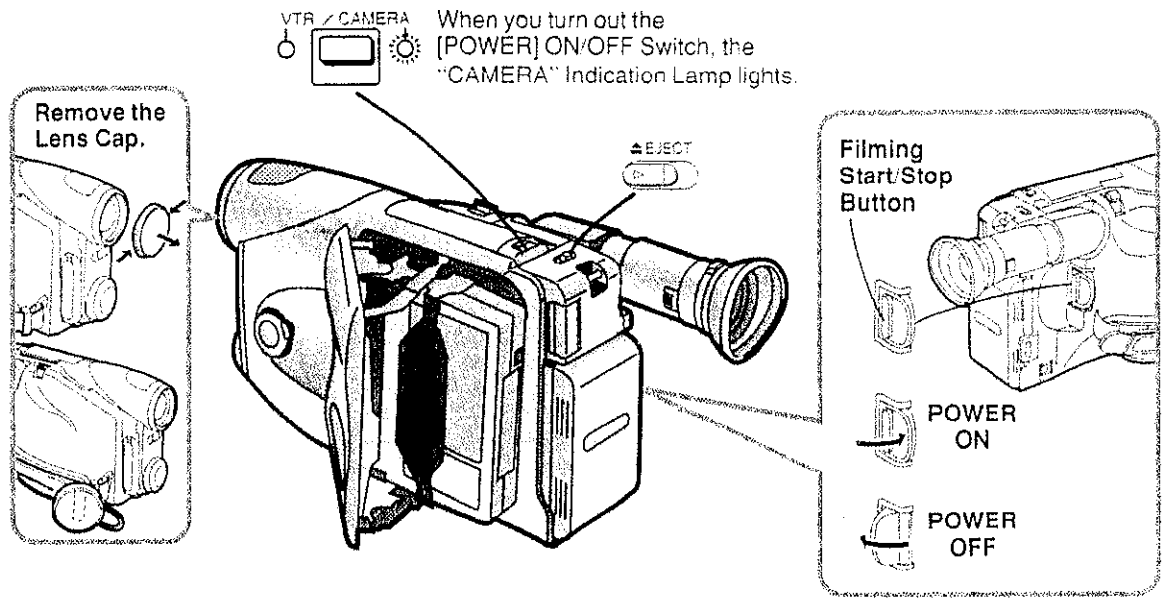


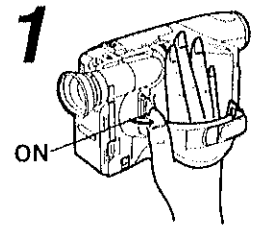
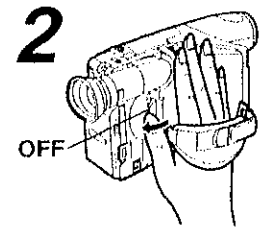
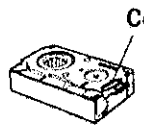
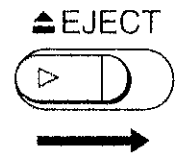
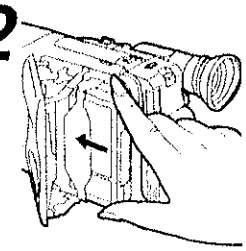
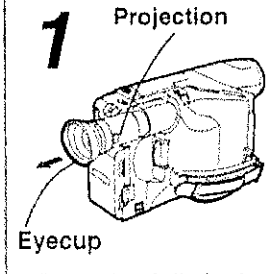
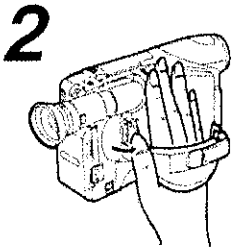
When pushing the Button, be sure to hold the Battery Pack to prevent it from dropping.

Remarks, etc.

Battery Pack No.	Charging Time	Max. Continuous Filming Time
Supplied	Approx. 60 min.	Approx. 60 min.
VW-VBS10E	Approx. 65 min.	Approx. 65 min.
VW-VBS20E	Approx. 130 min.	Approx. 130 min.
VW-VBH10E	Approx. 80 min.	Approx. 75 min.
VW-VBH20E	Approx. 160 min.	Approx. 150 min.

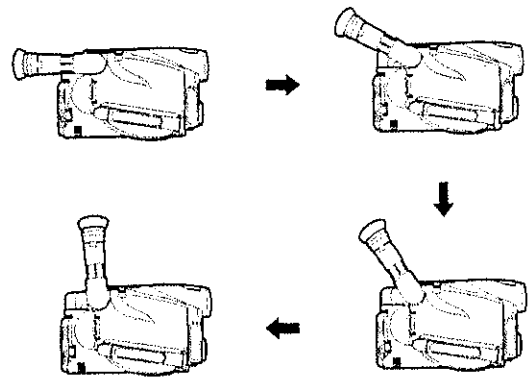
- The figures in the table above are based on an ambient temperature of 25°C.
- The use of the zoom and other functions increases the power consumption, so that the actual recording time per Battery Pack is 30%–50% less than for continuous filming.
- Charge the Battery Pack at a room temperature between 10°C and 35°C.
  The Battery Pack's ability to generate electric energy is based on a chemical reaction. Because this reaction can take place better at high temperature, the maximum filming time may be considerably shorter when filming at low temperature.
- Never remove the Battery Pack during filming or playback, because the tape would remain in contact with the video heads and this could cause damage to the heads and tape.
- If the Movie Camera has turned off automatically because the Battery Pack has become exhausted, remove the Battery Pack before connecting the DC Input Cable of the AC Adaptor to the Movie Camera to continue filming, otherwise the Movie Camera cannot be turned on.
- If you have any problems with charging the Battery Pack, refer to page 43.

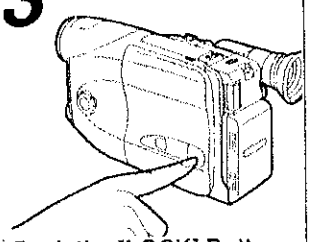
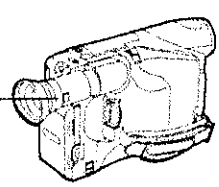

VTR / CAMERA
When you turn out the [POWER] ON/OFF Switch, the "CAMERA" Indication Lamp lights.
Remove the Lens Cap.
EJECT
Filming Start/Stop Button
POWER ON
POWER OFF

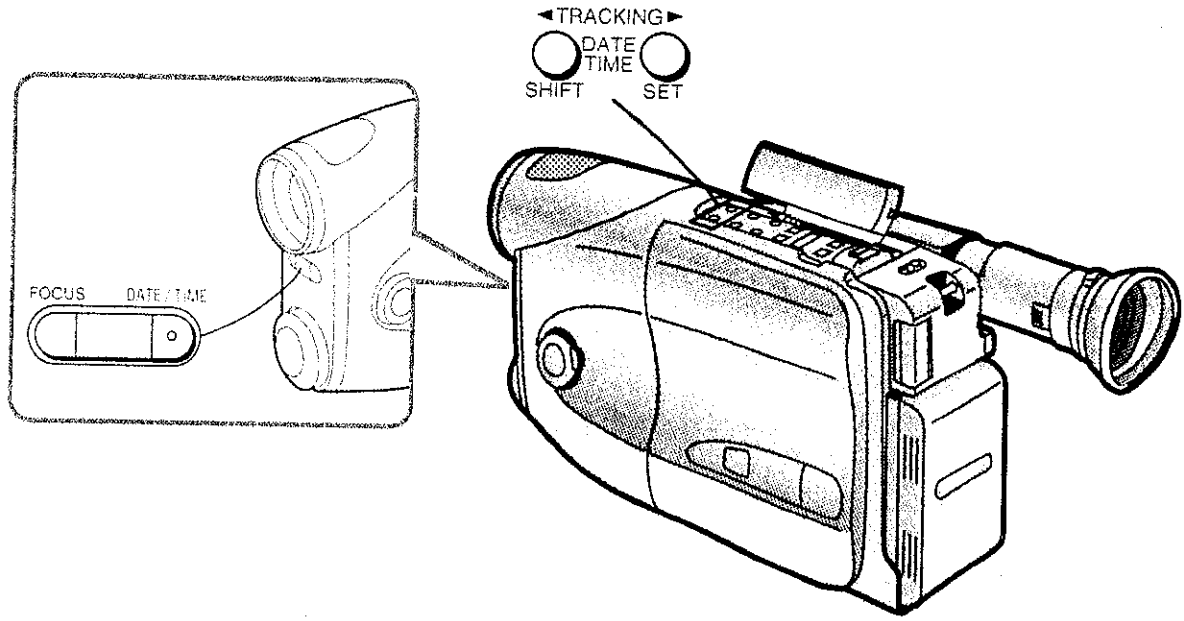
Title	Procedure	
Powering the Movie Camera ON/ OFF	**1**  Turn the [POWER] ON/OFF Switch out.	**2**  Turn the [POWER] ON/OFF Switch in.
Inserting a Video Cassette Before inserting the video cassette, make sure that the tape is tight. If it is loose, turn the cog wheel in the direction of the arrow to tighten it. 	**1**  Slide the [⏏ EJECT] Lever to the right.	**2**  Insert the video cassette.
Adjusting the Viewfinder Grasp the Viewfinder by the projections on either side (see Fig. 1) and pull it backward to its fully locked position.	**1**  Extend to fully locked position.	**2**  Turn the [POWER] ON/OFF Switch out.

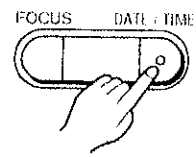
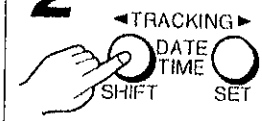
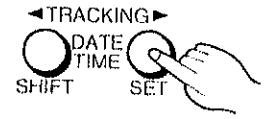
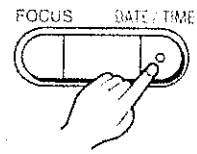
Adjusting the Angle of the Viewfinder

The tilting range of the Viewfinder is 90° (4 positions are marked by click stops).



	Remarks, etc.
	When you turn on the Movie Camera while a video cassette is already inside, it is automatically put in the Filming Pause Mode. (p. 15)
3  Push the [LOCK] Button.	**■ Ejecting the Video Cassette** After you have stopped filming, slide the [▲ EJECT] Lever to the right. The Cassette Compartment Cover opens after a few seconds and you can then take out the video cassette. •It is not possible to take out the video cassette during filming. •Do not repeatedly insert and take out the video cassette. This could cause the tape to become loose and damaged.
3 Eyepiece Corrector Ring  Look into the Viewfinder and turn the Eyepiece Corrector Ring until the indications in the Viewfinder are clear and easy to read.	•When extending the Viewfinder, do not grasp it by the Eyecup, because the Eyecup could become detached from the Viewfinder. •Do not hold the Movie Camera by the Viewfinder or apply any pressure on it. •Be sure to retract the Viewfinder after filming.



Title	Procedure
Setting the Date and Time Before setting, attach the charged Battery Pack or connect the AC Adaptor to the Movie Camera and turn the Movie Camera on. **For example:** To set the clock to October 15, 1995, 12:30...	**1**  **Press the [DATE/TIME] Button.** **2**  **Press until the "Year portion flashes.** **5**  **Press to set to "10".** **6** **Press to make the "Day" portion flash.** **9** **Press to set to "12".** **10** **Press to make the "Minute" portion flash**
Inserting and Deleting the Date and Time The Date and Time Indications can be inserted and deleted during filming as well as in the Filming Pause Mode.	 To insert or delete the Date and Time (or Date only) Indication, press this button repeatedly. The indications appear and disappear in the order shown on the right.

The Built-in Lithium Battery

A built-in rechargeable lithium battery inside the Movie Camera maintains the operation of the built-in clock when the Movie Camera is not in operation. Whenever the Movie Camera is in operation, it automatically recharges this battery. However, if you don't use the Movie Camera for a very long time, the lithium battery can become exhausted.
In this case, the "⏲" Indication in the viewfinder flashes and the date returns to the initial Indication "1.1. 1990".
If the "⏲" Indication in the Viewfinder flashes for approx. 10 seconds when you turn the Movie Camera on, the date and time settings have been reset because the lithium battery has been exhausted. Recharge it as follows:

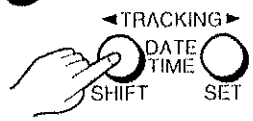
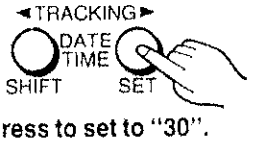
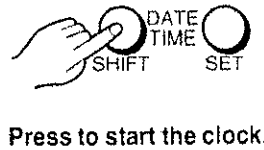
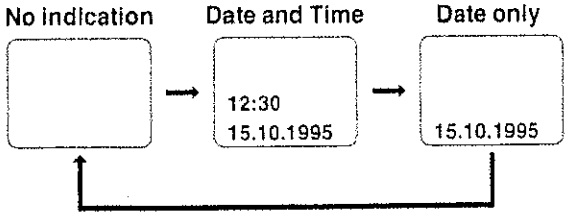
1 Connect the Movie Camera to the AC Adaptor and wait for approx. 8 hours.

2 **Switch on the Movie Camera.**

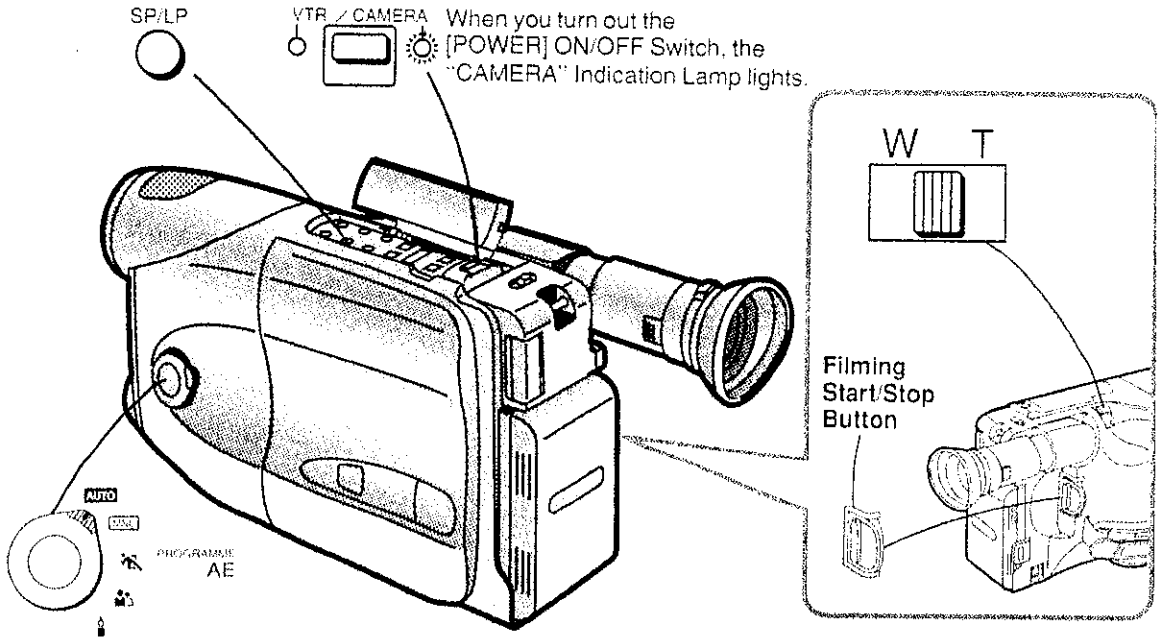
3 **Set the date and time as explained below.**
- After charging the lithium battery in this way, it can maintain the operation of the clock for approx. three months.

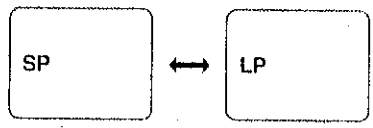
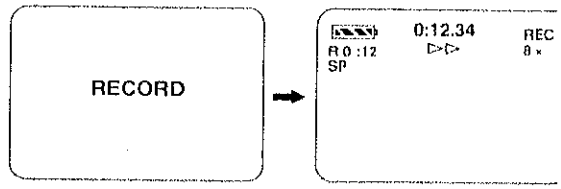
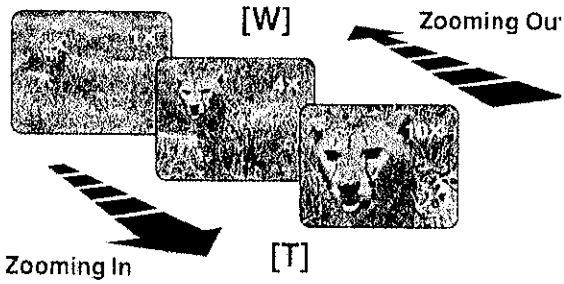
Information for your safety

WARNING
THE LITHIUM BATTERY IN THIS EQUIPMENT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. WHEN NECESSARY, CONTACT YOUR LOCAL PANASONIC SUPPLIER.

		Remarks, etc.
3 **Press to set to "1995".**	**4** **Press to make the "Month" portion flash.**	■ **Changing the Figures of the Date/Time Indication** You can change the Date/Time Indication in the order shown below by pressing the [SET] Button repeatedly. For example: Year: **1990**→1991→ . . . . . 2089→**1990**→... Month: **1**→2→ . . . . . →12→**1**→... Day: **1**→2→ . . . . . →31→**1**→... Hour: **0**→1→ . . . . . →23→**0**→... Minute: **00**→01→ . . . . . →59→**00**→... ●If you want to change the figures more quickly, keep the [SET] Button pressed. ●If you make a mistake during setting, start again from the beginning.
7 **Press to set to "15".**	**8**  **Press to make the "Hour" portion flash.**	
11  **Press to set to "30".**	**12**  **Press to start the clock.**	
		

Movie Camera Set-Up complete, now ready to use.



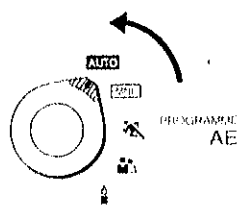
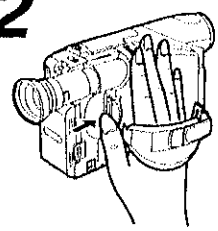
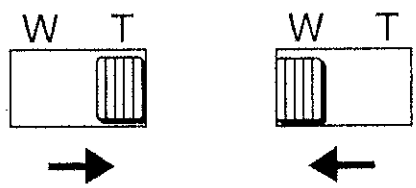
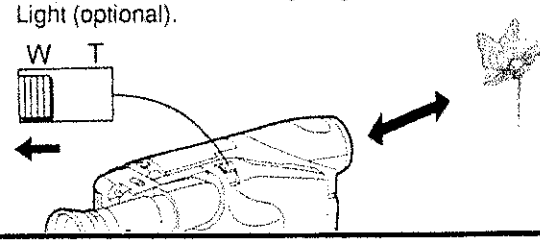
Title	Viewfinder
Starting Filming (Recording)  • Press the [SP/LP] Button to select the "SP" or "LP" Indication in the Viewfinder. "SP" means Standard Play. Filming is possible for the time indicated on the video cassette. "LP" means Long Play. Filming is possible for approximately double the time indicated on the video cassette. • Selecting the recording speed is only possible in the Filming Pause Mode.	 For the detailed explanations for each indication in the Viewfinder, see p. 18. Shown above is a typical example of the indications visible when filming in the Auto Mode.
Making the Subject Larger or Smaller During Filming (Zooming) Zooming is also possible in the Filming Pause Mode, so you can select the desired zoom setting before you start filming. • The zoom range extends from the wide-angle setting of the lens (1X) to the tele setting (10X). • In the maximum tele setting (10X), the minimum filming distance is 1.5 m. If you want to approach the subject closer, see p. 15 "Using the Macro Close-up Function".	 • The approximate selected zoom magnification is indicated in the Viewfinder.

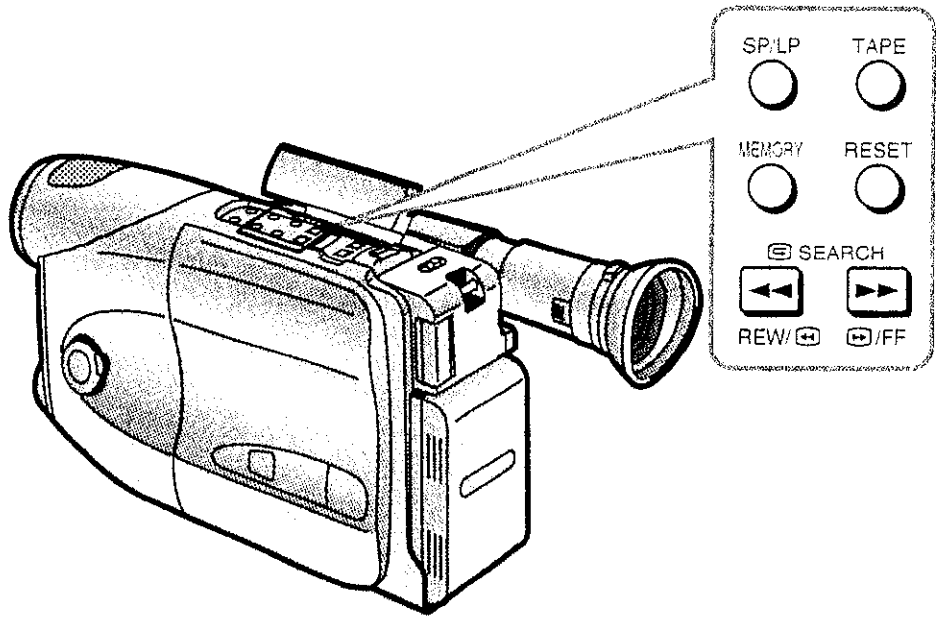
Index Signals (VISS)

Many VHS VTRs feature the Index Search and Intro Scan Functions that make it easy to locate the beginning of scenes marked with index signals. This Movie Camera automatically records an index signal in the following cases:

- When filming is started for the first time after attaching the Battery Pack.
- When filming is restarted after exchanging the cassette or after pressing the [VTR/CAMERA] Button.

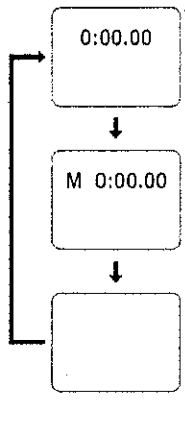
The "INDEX" Indication flashes briefly in the Viewfinder while the Movie Camera records an index signal.

Procedure	*Remarks, etc.*
1  **Confirm that the [AE] Selector is set to "AUTO".** **2**  **Press the Filming Start/Stop Button.**	**■ To Stop (Pause) the Filming:** Press the Filming Start/Stop Button. The "PAUSE" Indication appears in the Viewfinder. • If you leave the Movie Camera in the Filming Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. If you want to resume filming from this condition, turn the [POWER] ON/OFF Switch in (the Movie Camera switches off) and then turn it out again. **■ To Finish Filming:** Turn the [POWER] ON/OFF Switch in. (The Movie Camera switches off.)
1 **■ Zooming In** **■ Zooming Out**  **"T" means Tele.** **"W" means Wide.** • The zooming speed varies depending on how far you push the [W • T] Button towards "W" or "T". (The further you push it, the faster the zooming speed becomes.)	**■ Using the Macro Close-up Function** After keeping the [W • T] Zoom Lever pressed toward "W" to zoom to the maximum wide-angle setting, the subject can be focussed down to a minimum distance of only 5 mm between lens and subject. • As the depth of field is very small in this mode, even slight camera movements can cause the subject to go out of focus. Therefore, it is recommended to use a tripod (optional). • If you want to film pictures in a photo album or a similar situation with insufficient lighting, use a Video DC Light (optional). 

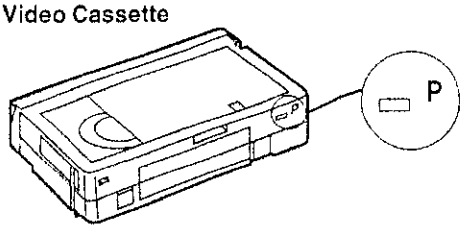


Title	Viewfinder	Procedure
Using the Tape Counter Indication The Tape Counter in the Viewfinder shows the elapsed recording or playback time in hours, minutes and seconds. To make it easy to keep track of the elapsed recording time, reset the Tape Counter to "0:00.00" by pressing the [RESET] Button.	0:00.00 Hours Minutes Seconds	**1** ■ **To Reset the Tap Counter:** RESET
Using the Memory Function The Memory Function makes it easy to locate the beginning of a desired scene or any other point during filming. To use this function, mark the desired point by following steps 1 to 3 on the right. When you then rewind or fast-forward the tape, it stops automatically at the "0:00.00" position.	M 0:00.00 Means: Memory	**1** ■ **To Make the "M" Indication Appea** MEMORY
Confirming the Remaining Tape Time During filming or playback, the Remaining Tape Time is automatically displayed in the Viewfinder. **Note:** This function is only meant as a guide. The Remaining Tape Time Indication is subject to imprecision due to either customer error (such as incorrectly selected Tape Length) or stretching of the tape.	30 R 0:30 Means: Remaining	**1** TAPE Select the Tape Length Indication (" 30" or " 45") that matches the Video Cassette bein used.

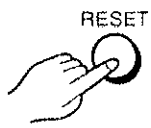
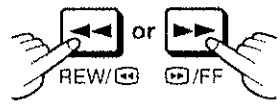
At every press of the [MEMORY] Button, the Counter Indication will change as follows:


0:00.00
Tape Counter Indication
M 0:00.00
Memory Indication "M" appears with Tape Counter Indication
No Indication
(All Indications except the Warning/Alarm Indications and the Tape Operation Mode Indications will disappear.)

Video Cassette

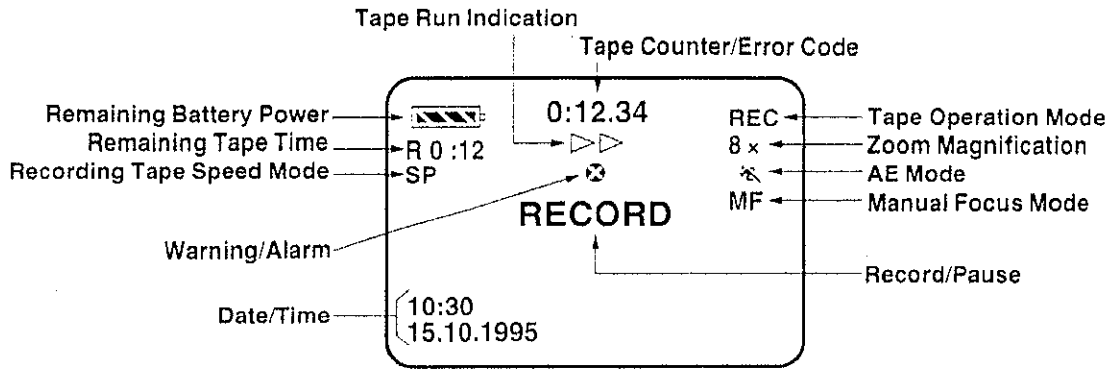


When using a video cassette bearing the "P" mark or an S-VHS-C video cassette, the Remaining Tape Counter Indication may not be very precise.

		Remarks, etc.
		• If you playback a tape on which no recording has ever been made, the Tape Counter Indication does not change. • If you take out the Cassette or remove the Battery Pack, the Tape Counter automatically resets to "0:00.00". • If you rewind the tape further than the tape counter position "0:00.00", the minus sign "–" appears in front of the Tape Counter Indication.
2 ■ **To Reset the Tape Counter:** 	***3*** 	
■ **To Check the Tape Length of the Video Cassette Being Used while the Remaining Tape Time is Displayed:** The Tape Length Indication " 30" or " 45" is displayed for approx. 2 seconds, and then the Remaining Tape Time Indication will again appear instead of it.		• If you start filming or playback, the "R" Indication flashes for a few seconds in the Viewfinder, while the Movie Camera calculates the Remaining Tape Time. • When the Remaining Tape Time becomes less than 2 minutes, the Indication "R" and the Remaining Tape Time start to flash. • If you use a video cassette with a nominal recording/playback time longer than 45 minutes, the Remaining Tape Time Indication is not accurate.

Quick Reference Guide to the Indications in the Viewfinder

The following indications are displayed in the Viewfinder to inform you about the condition of the Movie Camera.



- The illustrations in the following explanations show only the indication(s) pertaining to the corresponding explanation.

1 Warning/Alarm Indications

Viewfinder	Condition	Page
	Condensation Condensation has formed inside the Movie Camera. Wait until the "U 10/ [water drop] " Indication disappears.	42
	Video Head Clogging Dirt, dust and particles of the tape coating have accumulated on the video heads. Use a video head cleaning cassette or have the heads cleaned by qualified Service Personnel.	41
	Remaining Battery Power The 4 segments of the Remaining Battery Power Indication "[battery]" begin to disappear one after another as the power of the Battery Pack weakens. When only the last segment remains, the " [battery] " Indication starts to flash in the centre of the Viewfinder. When the last segment has disappeared, the "CAMERA" Indication Lamp flashes for a few seconds, and then the Movie Camera automatically switches itself off. Replace the exhausted Battery Pack with a fully charged one.	8
	Tape When no video cassette is inserted or when the tab of the inserted video cassette is broken out, this indication flashes. Insert a video cassette with intact tab.	10, 39

1 Warning/Alarm Indications (cont.)

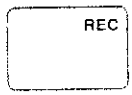
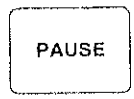
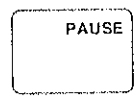
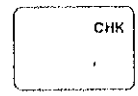
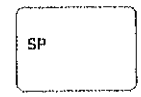
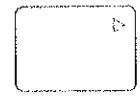
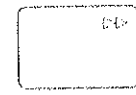
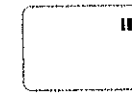
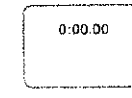
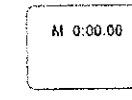
Viewfinder	Condition	Page
	Built-in Lithium Battery The Built-in Lithium Battery is exhausted. Recharge it.	13
	End of the Tape When the tape has reached its end, this indication appears. Insert a new video cassette.	—

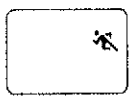
2 Error Code Indications

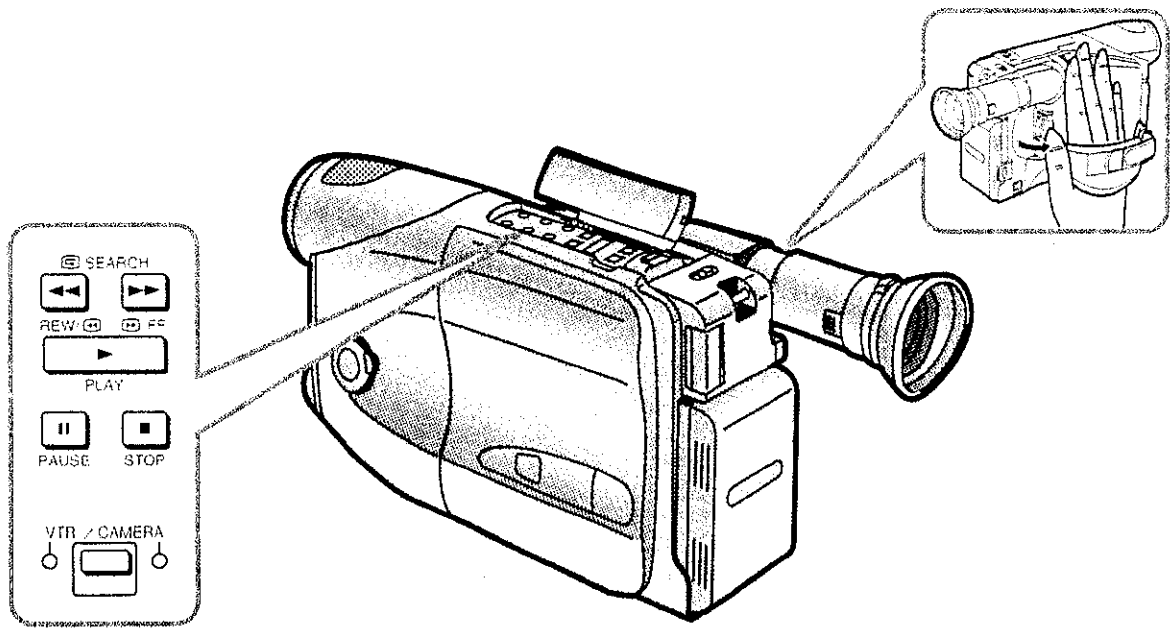
Viewfinder	Condition	Page
 F01 F02 F03 F04 F05 F51 F52	**Error Code** When the "F. ." Indication appears in the Viewfinder, some malfunction has occurred. If the indicated error code is between "F01" and "F05", the Movie Camera will turn itself off automatically one minute after the "CAMERA" Lamp has started to flash. (When the indication is "F51" or "F52", the Movie Camera will not turn off automatically.) In this case, write down the error code and tell it to the service personnel. F01: Locked Take-up Reel F02: Locked Supply Reel F03: Locked Unloading Mechanism F04: Locked Loading Mechanism F05: Locked Head Cylinder F51: Locked Focus Motor F52: Locked Zoom Motor	—

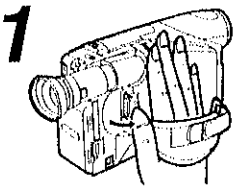
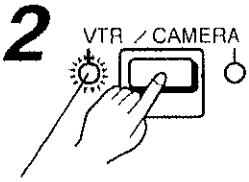
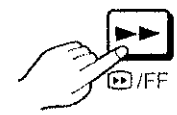
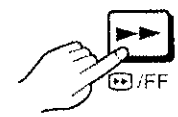
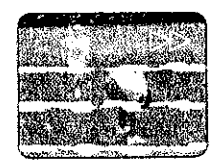
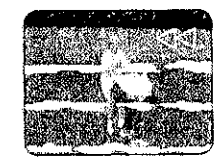
Quick Reference Guide to the Indications in the Viewfinder (cont.)

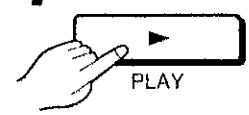
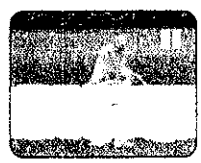
3 Filming/Playback Indications

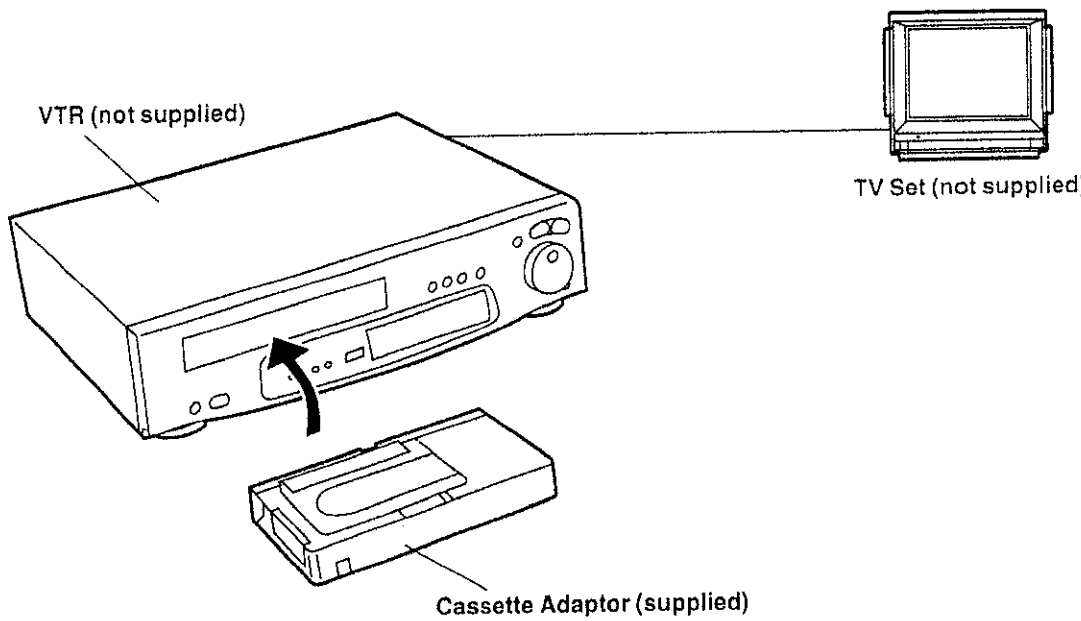
Viewfinder	Condition	Page
	Filming Mode (large indication) When the Filming Start/Stop Button is pressed from the Filming Pause Mode, this indication is displayed for approx. 1 second.	14
	**Filming Mode (small indication)** This indication appears approx. 1 second after you start filming and remains displayed until you stop filming. "REC" means Recording.	14
	Tape Run Indication	14
	**Filming Pause Mode (large indication)** When the Filming Start/Stop Button is pressed from the Filming Mode, this indication is displayed for approx. 1 second.	15
	**Filming Pause Mode (small indication)** This indication appears approx. 1 second after you pause the filming and remains displayed until you restart the filming, change over to the VTR Mode or turn the Movie Camera off.	15
	**Recording Review Mode** This indication is displayed while the last 2-3 seconds of the last recorded scene are being played back. "CHK" means Check.	32
	**Recording Speed Indication** SP: means Standard Play. LP: means Long Play. The mode can be selected with the [SP/LP] Button.	14
	**Playback/Search Mode**	23 31
	**Fast Forward/Cue Mode**	22
	Rewind/Review/Camera Search Mode	22 30
	**Still Playback Mode**	23
	**Tape Counter**	16
	**Tape Counter with activated Memory Function** "M" means Memory.	16
	Remaining Tape Time "R" means Remaining.	16

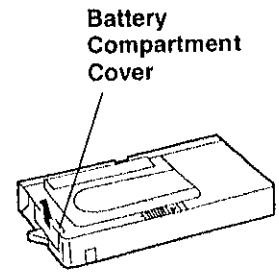
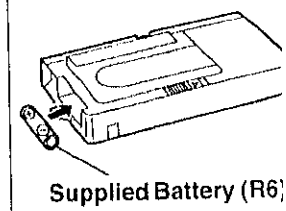
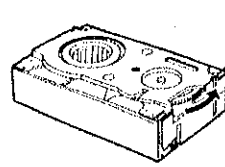
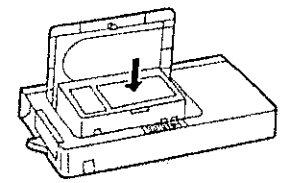
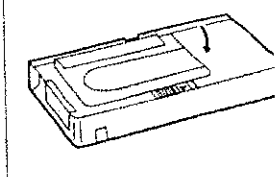
Viewfinder	Condition	Page
EC30	**Tape Length** The Tape Length Indication should be matched to the inserted video cassette (EC30 or EC45) to ensure correct indication of the remaining tape time.	16
12:30 15.10.1994	**Date and Time**	13
10×	**Zoom Magnification** When zooming in on a subject, the indicated zoom magnification value increases.	14
	**Sports Mode** This indication is displayed when you select the Sports Mode with the [AE] Selector.	28
	Portrait Mode This indication is displayed when you select the Portrait Mode with the [AE] Selector.	28
	Low Light Mode This indication is displayed when you select the Low Light Mode with the [AE] Selector.	28
MF	**Manual Focus Mode** "MF" means Manual Focus.	26
INDEX	**Index** While this indication is flashing, an index signal is being recorded.	15
MNL	**Manual Filming Mode** This indication is displayed when you select the Manual Filming Mode with the [AE] Selector. In this mode, you need to adjust the focus and the white balance adjustment manually. "MNL" means Manual.	26



Title	Procedure	
Playing Back on the Viewfinder or a TV **[To Play Back Via a TV Set]** 1. Connect the Movie Camera to a TV set. (p. 6, 34) 2. Follow steps 1 through 4 on the right.	**1**  Turn the [POWER] ON/OFF Switch out.	**2** VTR / CAMERA  The "VTR" Indication Lamp lights.
Rewinding or Fast-Forwarding the Tape Perform these operations with the Movie Camera in the VTR Stop Mode ("VTR" Indication Lamp is lit).	■ For Fast-Forwarding: 	■ For Rewinding:
Using the Cue, Review and Still Playback Functions During Normal Playback	■ For Cue Playback:  Keep pressed. Cue Playback Mode 	■ For Review Playback: Keep pressed. Review Playback Mode 

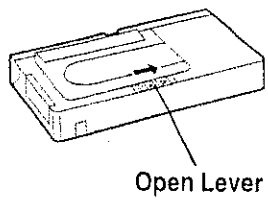
		Remarks, etc.
3 **The tape stops automatically when it reaches the beginning.**	**4** 	• If you reach the end of the tape during playback, the tape rewinds automatically. **■ To Stop the Playback:** Press the [STOP] Button. • If you have any problems with playback, refer to page 47.
		• If you reach the end of the tape during Fast-Forwarding, the tape rewinds automatically. • If you reach the beginning of the tape during Rewinding, the tape stops automatically.
■ For Still Playback:	**■ To Return to Normal Playback**	• The sound is played back only during normal playback. • In the Cue, Review and Still Playback Modes, horizontal noise bars appear in the picture, or the picture may become black and white or distorted. However, this is normal and not a malfunction. • The horizontal noise bars have a different pattern in the SP mode and LP mode. The illustrations on the left show the noise bar patterns of the LP mode. • If the Movie Camera is left in the Still Playback Mode for about 6 minutes, it will switch over to the Stop Mode to protect the tape and the video heads.
Still Playback Mode 		



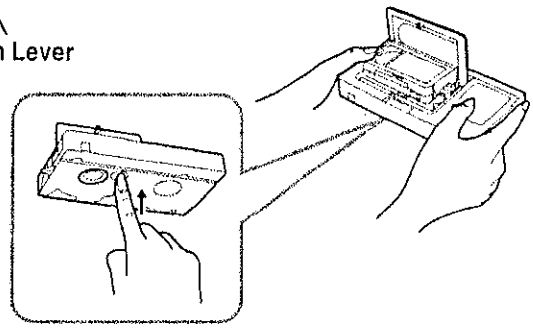
Title	Procedure	
Playing Back on a VTR, using the Supplied Cassette Adaptor	***1***	***2***
■ **Tighten the Tape.**		
	**Remove the Battery Compartment Cover.**	**Insert the Battery (R6).**
Before inserting a video cassette, check that the tape is tight. If it is loose, tighten it by turning the cog wheel in the direction of the arrow.	***5***	***6***
		
	Insert the recorded video cassette.	**Close the Top Cover.**

Removing the Video Cassette

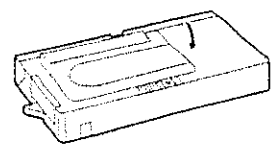
1 Slide the Open Lever.



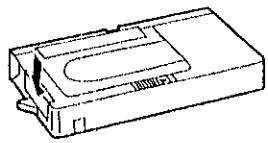
2 Push out the video cassette from the bottom of the Cassette Adaptor and remove the video cassette.



3 Close the Top Cover.

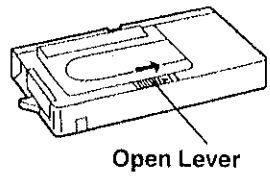


3



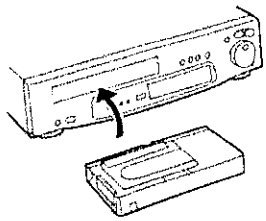
Re-attach the Battery Compartment Cover.

4



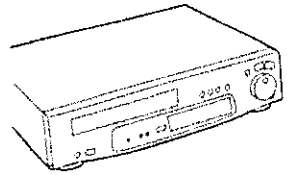
Slide the Open Lever.

7



Insert the Cassette Adaptor into the VTR.

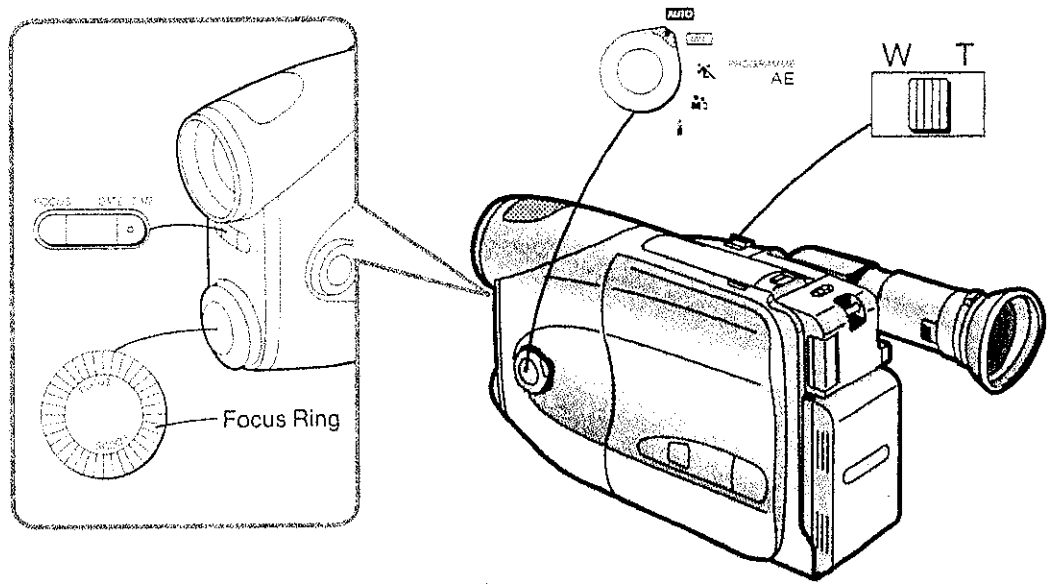
8

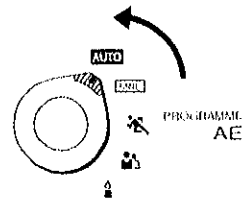
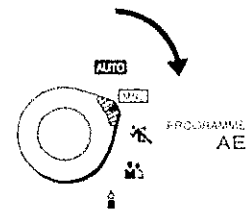
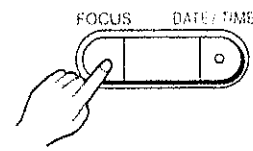


Operate the VTR.

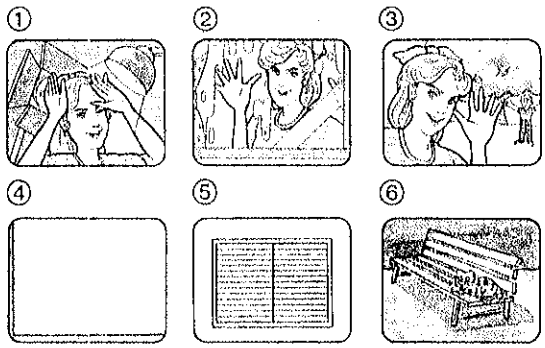
Remarks, etc.

- If you want to get optimum picture quality, it may be necessary to adjust the tracking control on the VTR.
- Never insert the Cassette Adaptor into a VTR unless it is loaded with a video cassette.
- Do not insert the Cassette Adaptor into a VTR and take it out again without running the tape, because this could loosen the tape.
- When you load the video cassette into the Cassette Adaptor or remove it, be careful not to touch the tape.
- After use, take the video cassette out from the Cassette Adaptor.



Title	Procedure	
Filming in the Auto Focus Mode When the [AE] Selector is set to "AUTO", the Movie Camera will automatically focus precisely on almost any subject located in the centre of the Viewfinder. "AE" means Auto Exposure. ● If you want to film with automatic focusing in one of the other settings of the [AE] Selector, press the [FOCUS] Button to make the "MF" Indication in the Viewfinder disappear.	***1*** 	
Filming in the Manual Focus Mode	***1***  The "MNL" Indication appears in the Viewfinder.	***2***  The "MF" Indication appears in the Viewfinder.

Remarks, etc.



If you want to film the following types of subjects, it is advisable to use the Manual Focus Mode:

① A subject with shiny surfaces or much light reflection

② A subject behind glass that is covered with dirt, dust or water drops

③ A subject with a part of it near the Movie Camera and another part far away from it.

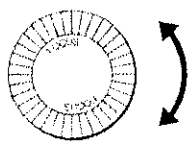
④ A flat surface, e.g. a white wall

⑤ A subject with horizontal stripes

⑥ An oblique subject

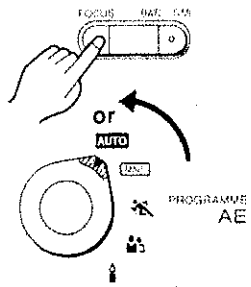
- A fast-moving subject
- A subject with a dark surface
- When using the Macro Close-up Function, special lenses or filters

3



Turn the Focus Ring until the subject is in focus.

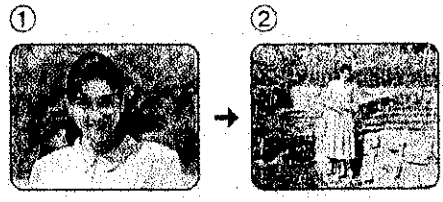
■ To Cancel the Manual Focus Mode:



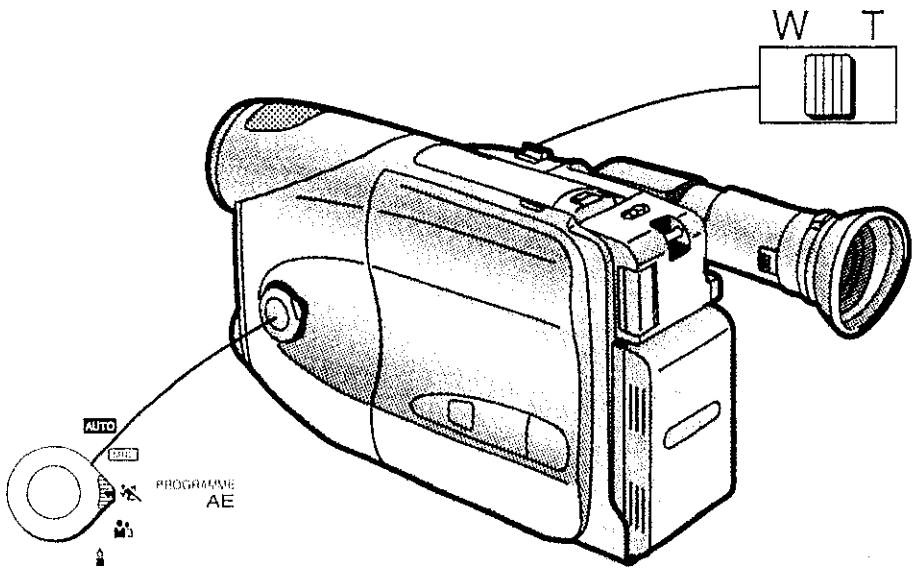
Press the [FOCUS] Button to make the "MF" indication disappear. Or reset the [AE] Selector to "AUTO".

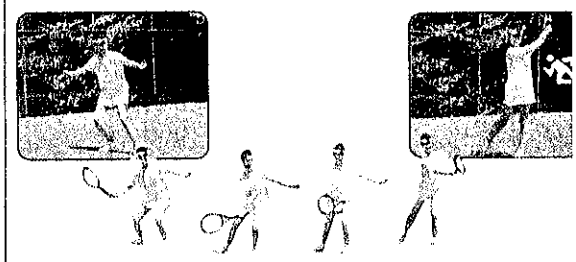
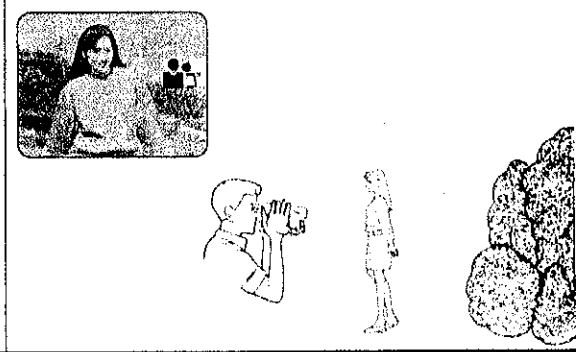
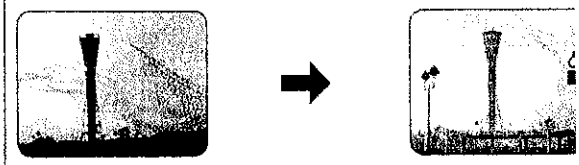
■ Hints for Manual Focus Adjustment

- If you want to ensure that the subject remains precisely focused at any zoom setting, first zoom in on the subject until it fills the Viewfinder ①. After adjusting the focus zoom back and frame the subject as desired ②.



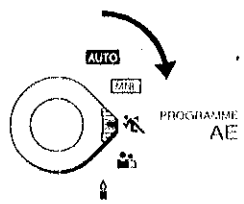
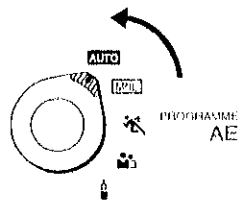
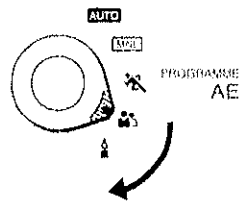
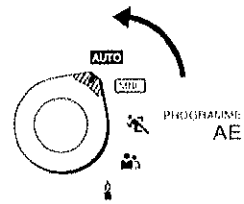
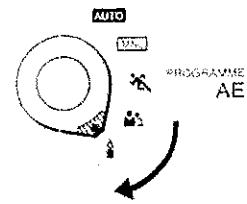
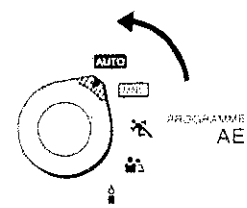
- If you adjust the focus in the wide-angle setting, the subject may go out of focus when you later zoom in on the subject.

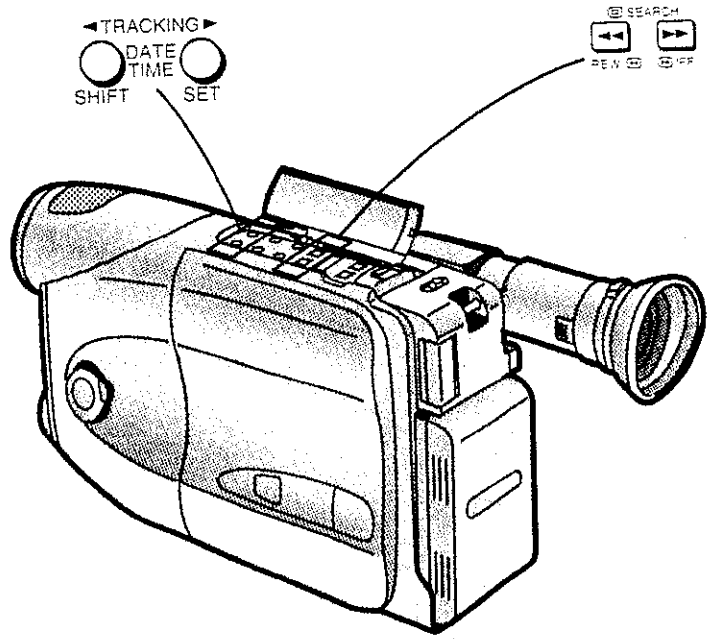


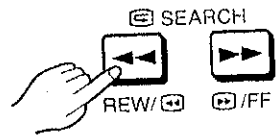
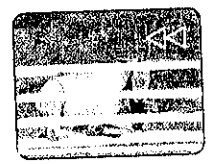
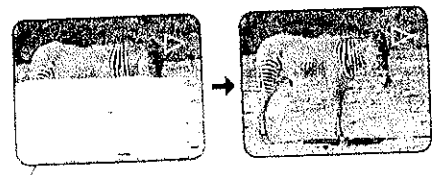
Title	Viewfinder
Filming Fast-Moving Subjects ■ **Using the Sports Mode** Use this function to film sports and other fast-action scenes, if you want to play back these scenes in a VTR using still and slow motion playback for motion analysis. This provides sharp picture contours and enhanced detail.	
Making Subjects Stand out Sharply from the Background ■ **Using the Portrait Mode** In the Portrait Mode, the iris is automatically set to the maximum aperture for a very small depth-of-field. This gives you a sharply focused subject in the centre of the picture with a blurred background and foreground.	
Filming Dark Scenes More Brightly ■ **Using the Low Light Mode** The Low Light Mode lets you brighten up the picture when filming under dim lighting, for example outdoor scenes at dust or under party lighting or indoor scenes under weak room lighting.	

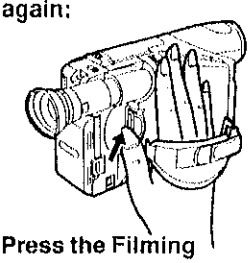
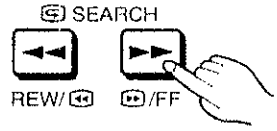
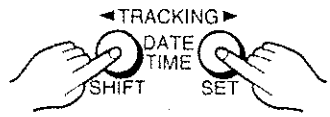
Notes for Use of the Sports Mode

- The subject must be brightly lit by sunlight or other strong light and contain little shadow.
- If you want to film under fluorescent, mercury-vapour or natrium lamps, some flickering may be noticeable.
- The picture may become slightly darker, and during normal playback, the picture movement may not be as smooth as usual.

Procedure		Remarks, etc.
1 	**To Return to the Normal Filming Mode:** 	• The shutter speed is automatically adjusted (between 1/50s and 1/500s) according to the brightness of the scene. • If you film under weak lighting, the " " Indication flashes to warn you that the Sports Mode may not be effective.
1 	**To Return to the Normal Filming Mode:** 	• If you want to increase the blurring of the background and foreground, zoom in on the subject.
1 	**To Return to the Normal Filming Mode:** 	• If you use this mode for filming outdoors in daylight, the result will be almost the same as when filming in the normal filming mode.

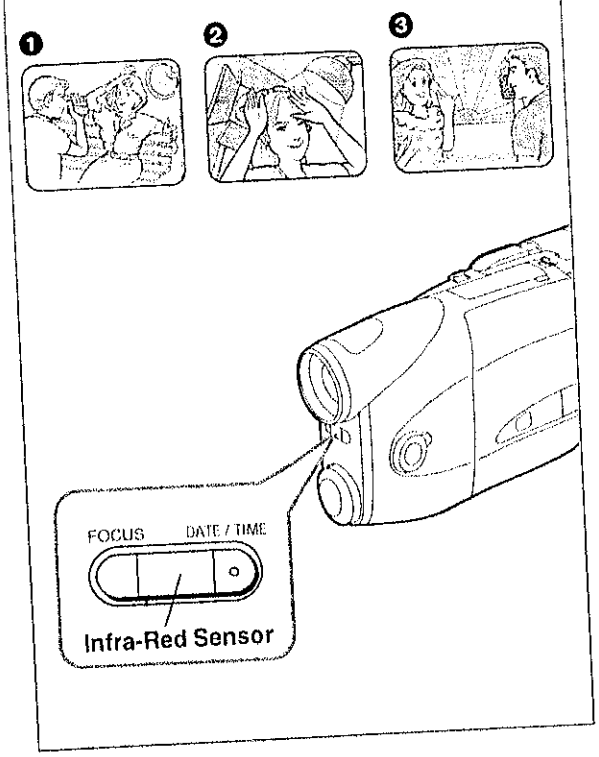


Title	Procedure
Checking the End of a Recorded Scene For occasionally important scenes, use this check function during filming to confirm that the recording has been performed correctly.	**1** **Press while in the Filming Pause Mode.**
Locating a Point Where You Wish to Add a New Scene Film the individual scene a little longer than actually required. You can then rewind the tape and determine the exact point where you wish to join the next scene. When the [SEARCH] Button is then released, the Movie Camera returns to the Filming Pause Mode.	**1** ■ Reverse direction   **Keep pressed while in the Filming Pause Mode.**
Eliminating Picture Distortions by Adjusting the Tracking When playing back a recorded tape, especially a tape recorded on another Movie Camera, horizontal bands of white noise may appear in the picture. If this occurs, you can eliminate them by adjusting the tracking.	 White noise bands

	Remarks, etc.
2 To start the filming again:  Press the Filming Start/Stop Button.	•The final 2 seconds of the last recorded scene will be played back in the Viewfinder and then the Movie Camera returns to the Filming Pause Mode.
2 ■ Forward direction  Keep pressed while in the Filming Pause Mode.	•If you keep pressing [REW/◄◄] Button: The Indication "◁◁" appears in the Viewfinder. The scene is played back in reverse direction at 3 times normal speed in the SP Mode and 6 times in the LP Mode. •If you keep pressing [►►/FF] Button: The Indication "▷" appears in the Viewfinder. The scene is played back in forward direction at normal speed.
1  Press both the [◄ TRACKING] and [TRACKING ►] Buttons simultaneously.	•If you press both buttons simultaneously but the picture quality does not improve, adjust by pressing the [◄ TRACKING] or [TRACKING ►] Button individually. (It may not be possible to remove the noise bands completely.)

White Balance Adjustment

In the following filming situations, precise White Balance Adjustment may not be possible.



The Movie Camera will automatically perform the white balance to assure natural colours under almost any filming condition.

❶ When filming under mercury-vapor, natrium or some types of fluorescent lamps etc.

❷ When intense lighting is used, e.g. spot lights in a theatre or when the colour temperature of the light source is low.

❸ When filming at sunrise or sunset.

- When filming with an ND Filter (optional) or a Tele or Wide Conversion Lens (optional).
- If you take the Movie Camera from outdoors to indoors during filming, the picture will initially take on a slightly reddish cast but will gradually regain its natural colours.
- Be careful not to cover the Infra-Red Sensor with your hand, etc. during filming.
- If you want to film under a type of lighting that is outside the range in which the White Balance Adjustment Function is effective (see Colour Temperature Chart below).

Colour Temperature and White Balance

The colour temperature of the light source is measured in Kelvin. The higher the Kelvin value is, the more bluish is the light; the lower the value, the more reddish is the light. This is not directly related to the brightness.
The table below shows the relationship between natural light, artificial light and colour temperature.

Natural Light	Colour Temperature		Artificial Light	Effect on the picture
•Blue sky	10,000 K			Bluish colour: Bluish The picture will have a slightly colour bluish cast.
•Slightly overcast sky	7,000 K~ 8,000 K	8,000 K~ 9,000 K	•TV screen	
•Cloudy sky (Rain)	6,000 K			Within this range, the Movie Camera's White Balance Adjustment Function is effective and ensures pictures with natural colours.
•Sunlight	5,000 K			
		4,800 K	•Fluorescent lamp (white)	Whitish colour
•1 ~2 hours after sunrise or before sunset	3,000 K~ 4,200 K	2,500 K~ 3,500 K	•Flourescent lamp (not white) or studio lamp	
•Sunrise or sunset	2,000 K~ 2,500 K	2,000 K~ 2,800 K	•Halogen light bulb	Reddish colour: The picture will have a slightly reddish cast
		2,000 K~ 2,500 K	•Tungsten lamp	
		1,500 K~ 2,000 K	•Candlelight	

Lighting

■ Outdoors

Choose a Movie Camera position with the sun in your back, so that the sunlight falls evenly on the subject and makes for a beautiful picture. See the table below to decide whether a Filter Kit (VW-LF37E; optional) or a Video DC Light (VZ-LDCS13E; optional) is necessary to obtain brilliant pictures with vivid colours.

■ Indoors

It is possible to film indoors under fluorescent, halogen, tungsten or even candlelight. However, note that the brighter the subject is lit, the more vivid a picture will be obtained. Therefore, it is recommended to brighten up the scene with additional lighting, such as a Video DC Light (VZ-LDCS13E; optional) or a spot light. However, if you want to capture the special mood of a dimly lit indoor (or outdoor) scene, filming is possible in the Low Light Mode under weak lighting down to only 1 lux.

Standard Values of Brightness

The values shown in this table are rough approximations for general reference.

Lux: Unit of illumination (the larger the figure, the brighter the light source)

Lux	Place or Type of lighting	To obtain Pictures with Vivid Colours
100,000	•Snow—covered mountains •Mid-summer beach •Sunlight at noon, clear sky (100,000 lux)	An ND Filter (contained in Filter Kit VW-LF37E; optional) is recommended to dampen the excessive light and obtain stronger colours.
10,000	•Sunlight at 10 AM, clear sky (65,000 lux) •Sunlight at 3 PM, clear sky (35,000 lux) •Sunlight at noon, cloudy sky (32,000 lux) •Sunlight at 10 AM, cloudy sky (25,000 lux)	Range for filming without need for a Filter Kit (VW-LF37E; optional) or additional lighting.
1,000	•Sunlight one hour after sunrise, cloudy sky (2,000 lux) •Sunlight one hour before sunset, clear sky (1,000 lux)	
500	•Inside a department store, bright office (500–700 lux)	
100	•Street light (50–100 lux)	Additional lighting is recommended for most types of lighting in this range to obtain pictures with vivid colours.
20	•Candlelight at 20 cm distance (10–15 lux)	Additional lighting is necessary to obtain satisfactory picture quality.

■ Optional Accessories

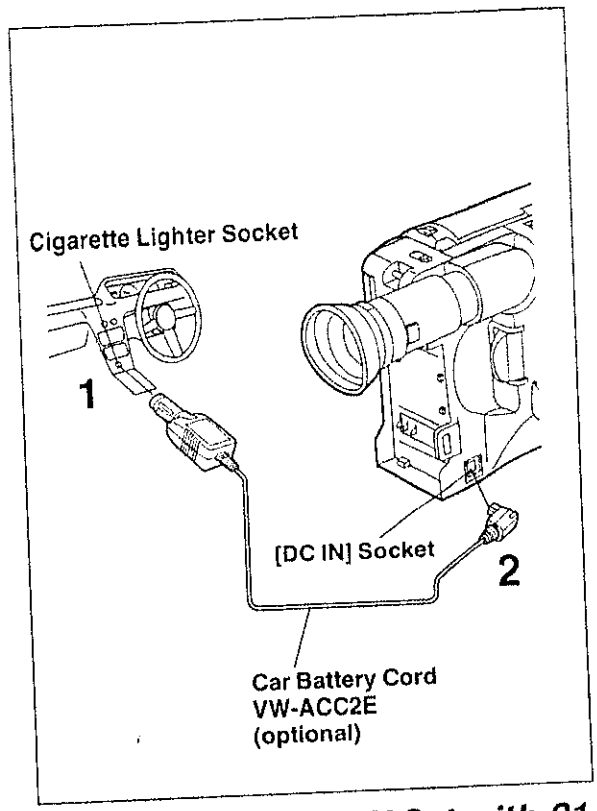
•Video DC Light (VZ-LDCS13E)

This Video DC Light is recommended for filming in a dark room as well as for filming photographs and pictures with the macro function (p. 15). To attach the Video DC Light (VZ-LDCS13E) to the Movie Camera, the Shoe Adaptor (VW-SK9E) is necessary.

•Filter Kit (VW-LF37E)

The Filter Kit (VW-LF37E) contains an ND Filter and an MC Protecter. The ND Filter is recommended for filming in extremely bright places, e.g. on a beach or ski slope. It prevents the picture from becoming whitish, yet without changing the colours. (When filming with the ND Filter attached, White Balance adjustment would not work precisely.) The MC Protector is used for protecting the lens and it can be used for virtually any kind of filming.

Using the Car Battery Cord (Optional)



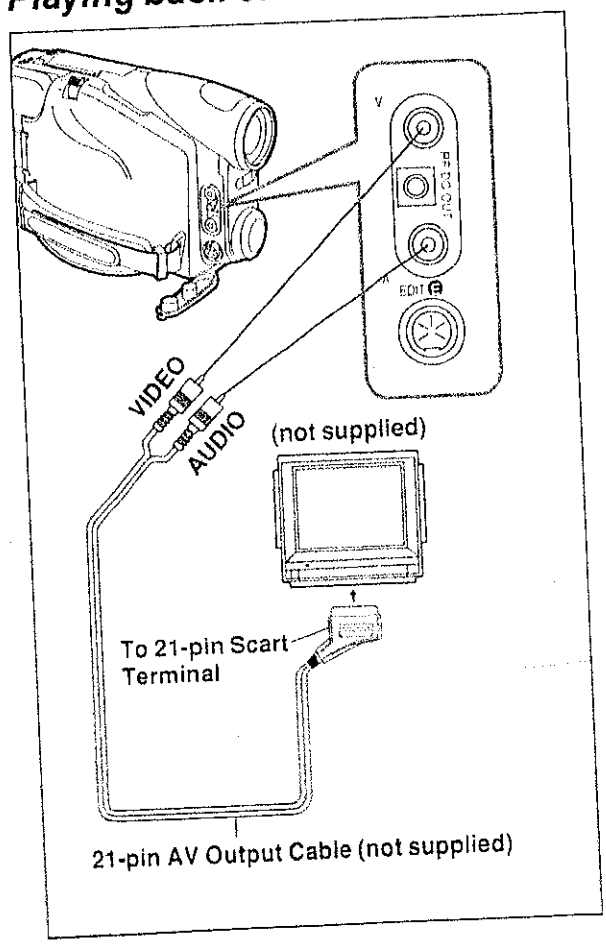
Notes:

1. The Car Battery Cord can only be used with 12 V DC negative-grounded vehicles.
2. Do not start the car engine while the Movie Camera is being powered by the car battery.
3. If the voltage drops suddenly e.g. because the car air-conditioner is turned on, the Movie Camera is automatically turned off to protect it. Wait about 10 seconds before turning it on again.
4. Some cars, RVs and campervans use 24 V. Please confirm with vendor that your vehicle uses 12 V before using the Car Battery Cord. If used on 24 V, damage may occur and is not covered by the warranty.

1 Start the engine and then plug the Car Battery Cord into the Cigarette Lighter Socket.

2 Connect the other end of the cord to the DC Input Socket on the Movie Camera.

Playing back on a TV Set with 21-pin Scart Terminal

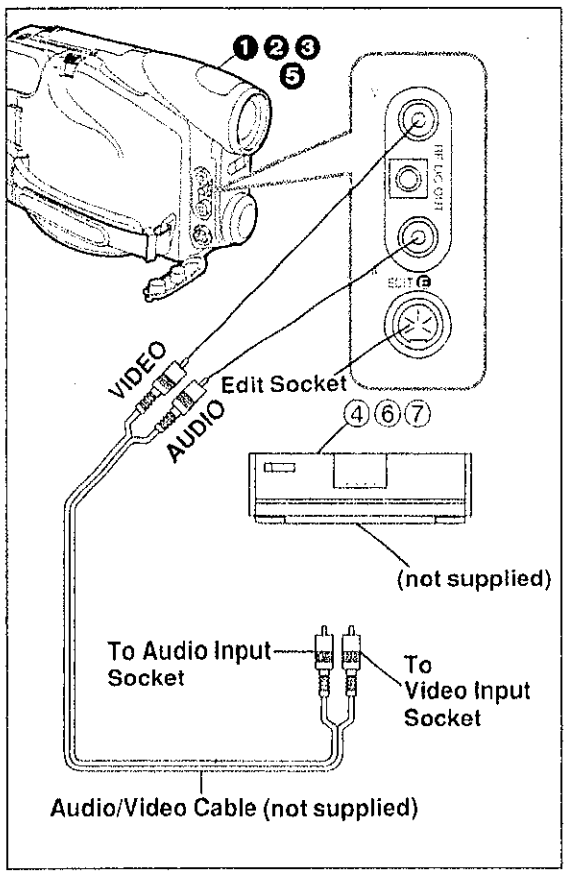


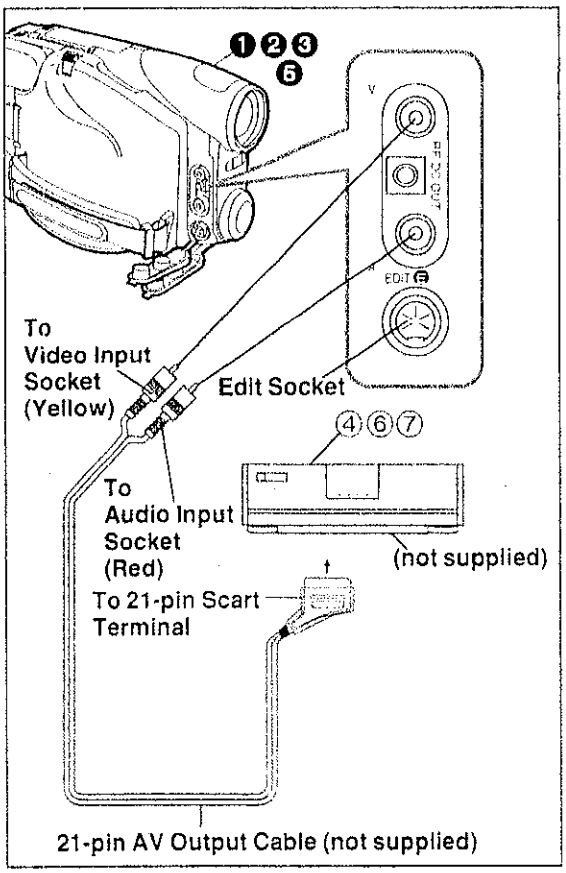
Using a 21-pin AV Output Cable (not supplied)

Connect after turning off the Movie Camera and the TV Set.

■ **Activate the Playback Operation**
(p. 22)

Editing a Previously Recorded Tape





Connect the Movie Camera to the VTR using the Audio/Video Cable or 21-pin AV Output Cable.

■ Operations

Playback Unit (Movie Camera): ❶❷❸❺

Recording Unit (VTR): ④⑥⑦

❶ Insert the recorded video cassette for playback into the Movie Camera.

❷ Play back the tape and locate the end of the scene that you want to dub, and note the tape counter position.

❸ Rewind the tape and locate the beginning of the scene that you want to dub.

④ Insert the video cassette for recording into the VTR and put it in the Recording Pause Mode. Also read the Operating Instructions of the VTR.
The picture quality deteriorates slightly in the dubbing process, however, this can be minimized by selecting the standard recording speed (SP Mode) on the VTR.

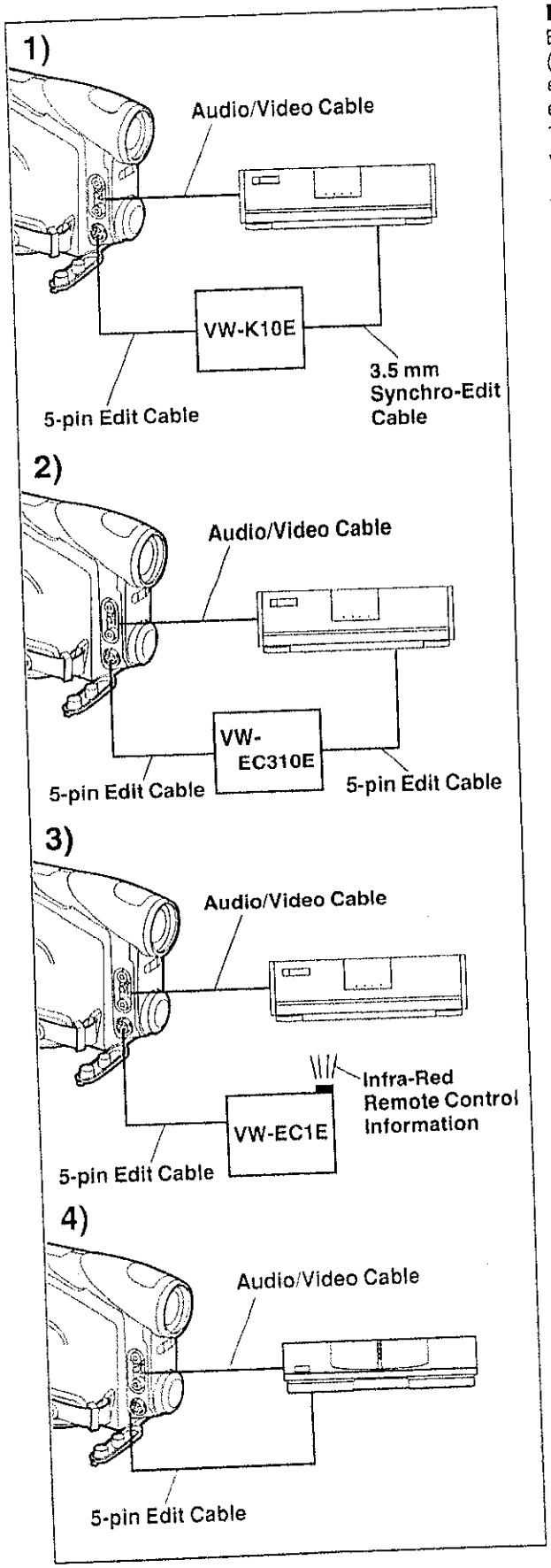
❺ Start the playback.

⑥ Press the Pause/Still Button to start recording.

⑦ As soon as the Tape Counter Indication on the Movie Camera reaches the position noted in step ❷:
Press the Pause/Still Button to put the VTR in the filming pause mode, thus finishing the dubbing.

❽ For all additional scenes that you want to dub, follow the above steps ❷ to ⑦.

Editing a Previously Recorded Tape (cont.)

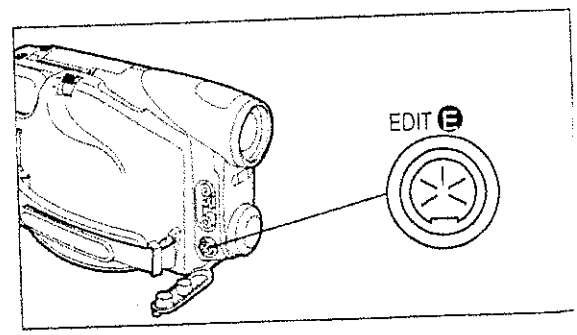


■ [EDIT] Socket

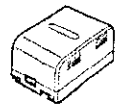
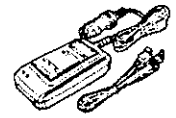
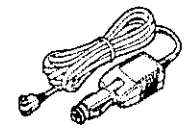
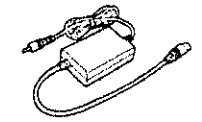
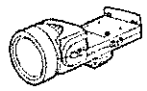
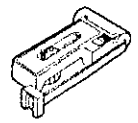
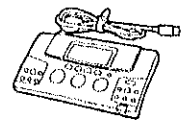
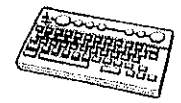
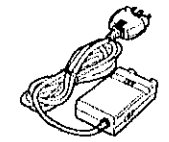
By connecting a Panasonic Editing Controller (optional) to this socket as well as to a Panasonic VTR equipped with Edit Socket, highly precise and speedy editing becomes possible.
The following types of Editing Controller can be used with this Movie Camera.

1) Connecting the Movie Camera to a Panasonic VTR equipped with synchro-edit socket (3.5 mm stereo jack) as the recording unit, using the 5-pin Synchro Cord VW-K10E (optional).
   - This is a single event edit controlling system. Therefore, the user needs to know the start and end points of the scene to be edited and needs to start and stop the editing manually.
2) Connecting the Movie Camera to a of Panasonic VTR equipped with 5 pin edit socket as the recording unit, using the Editing Controller VW-EC310E (optional).
   - This Editing Controller can be programmed for automatic editing of up to 8 scenes.
   - When using this Editing Controller, be sure to edit with the "Standard-Speed Mode".
3) Connecting the Movie Camera to any brand of VTR equipped with Infra-Red Remote Controller as the recording unit, using the Editing Controller VW-EC1E (optional).
   - This Editing Controller can be programmed for automatic editing of up to 4 scenes.
4) Connecting the Movie Camera to a Panasonic VTR with built-in Editing Controller.
   Consult the operating instructions of the VTR for details.

Note:
The full instructions as written in the Operating Instructions of the Editing Controllers and the 5-pin Synchro Cord must be followed or the edit function may not operate correctly.
This may not be a fault of the Movie Camera.



Optional Accessories

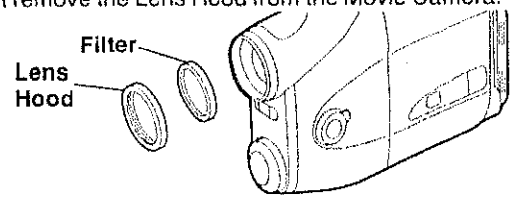
Battery Pack VW-VBS10E VW-VBH10E 	Battery Pack VW-VBS20E VW-VBH20E 	Car Battery Charger VW-KBC2E 	Car Battery Cord VW-ACC2E 	5-Pin Synchro Cord VW-K10E 
Video DC Light VZ-LDCS13E  The Shoe Adaptor (VW-SK9E; optional) is necessary.	Shoe Adaptor VW-SK9E 	Filter Kit VW-LF37E 	Special Effect Filter Kit (A) VW-LFA37E 	Special Effect Filter Kit (B) VW-LFB37E
Tele Conversion Lens VW-LT3714E 	Wide Conversion Lens VW-LW3707E 	Standard Tripod VZ-CT55E 	Deluxe Tripod VZ-CT75E 	Cassette Adaptor VW-TCA7E
Editing Controller VW-EC310E 	Editing Controller VW-EC1E 	Video Titler VW-VT1B 	RF Adaptor VW-RF7E 	

Notes:

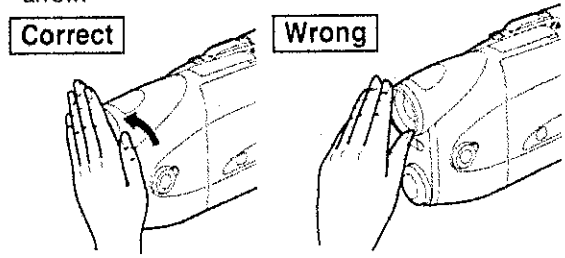
- Consult your dealer for details of other accessories not listed here.
- Some of the accesories listed above may not be available in some countries.

■ Lens Hood

Before attaching an optional filter or conversion lens, first remove the Lens Hood from the Movie Camera.



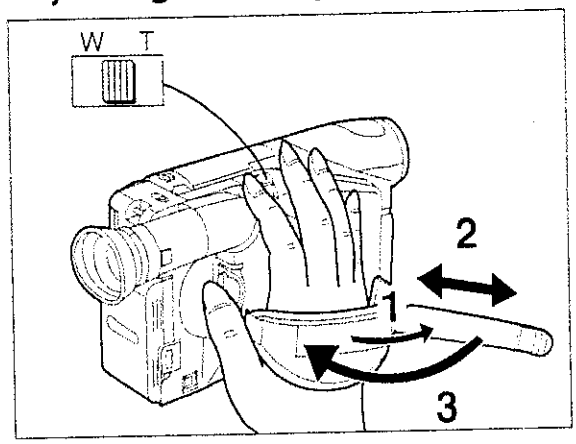
- To remove the Lens Hood, press with the palm of your hand against it and turn in the direction of the arrow.



■ Charging Time and Maximum Time for Continuous Filming

Battery Pack No.	Charging Time	Max. Continuous Filming Time
VW-VBS10E	Approx. 65 min.	Approx. 65 min.
VW-VBS20E	Approx. 130 min.	Approx. 130 min.
VW-VBH10E	Approx. 80 min.	Approx. 75 min.
VW-VBH20E	Approx. 160 min.	Approx. 150 min.

Adjusting the Length of the Grip Belt



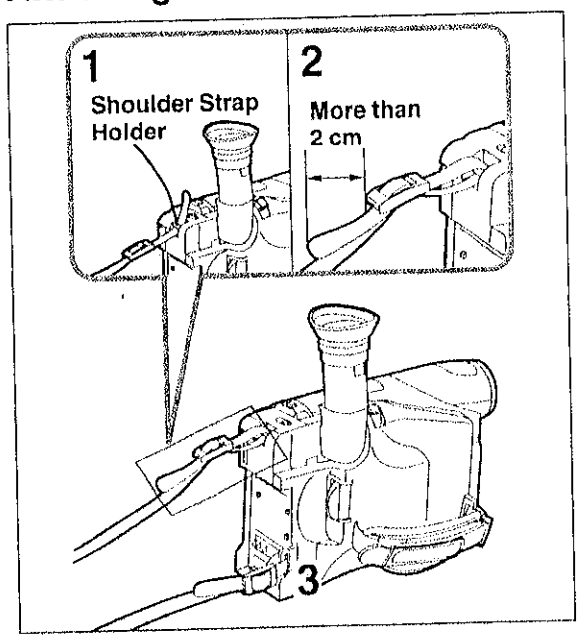
Adjust the Grip Belt so that you can press the Filming Start/Stop Button with the thumb, and the [W • T] Zoom Lever with the index finger.

1 Unfasten the velcro tape closure.

2 Adjust the length to the size of your hand.

3 Fasten the velcro tape closure.

Attaching the Shoulder Strap

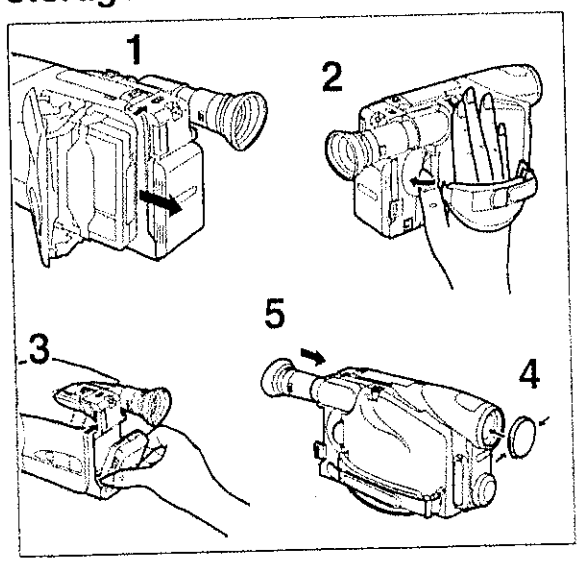


1 Pull the end of the Shoulder Strap through the Shoulder Strap Holder.

2 Securely attach the end of the Shoulder Strap. (More than 2 cm)

3 Attach the other end of the Strap in the same way.

Storage



1 Slide the [▲ EJECT] Lever and remove the video cassette.

2 Turn the [POWER] ON/OFF Switch in. (The Movie Camera switches off.)

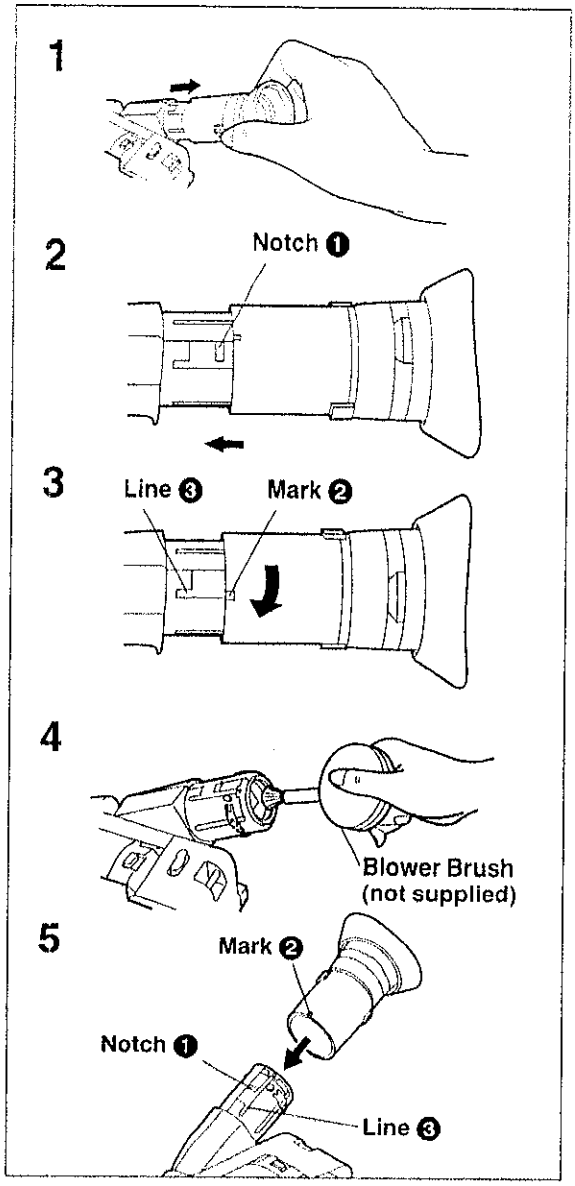
3 Push the [BATTERY EJECT] Button and remove the Battery Pack.

4 Attach the Lens Cap.

5 Retract the Viewfinder.

Note:
Remove the Battery Pack from the Movie Camera after use and keep it in a cool place. If the Battery Pack remains attached to the Movie Camera, a small amount of current flows to the Movie Camera, even if the [POWER] ON/OFF Switch is turned in, and this reduces the charge of the Battery Pack.

Cleaning the Viewfinder



1 Grasp the projections on the either side of the Viewfinder and fully extend it.

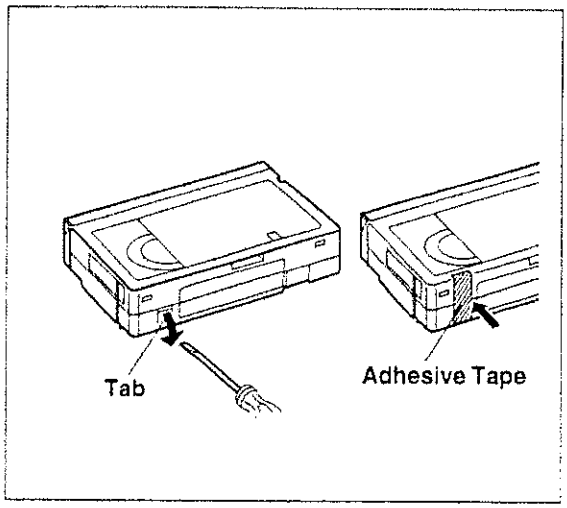
2 Push the Viewfinder back approx. 3 mm so that its front edge is precisely aligned with the notch ❶.

3 Turn the Viewfinder counterclockwise so that the mark ❷ is aligned with the line ❸ and pull it off.
(While turning it, some increased resistance can be felt; however, be sure to turn it to the line ❸.

4 Remove dust with a blower brush (not supplied).

5 To re-attach the Viewfinder, align the mark ❷ with the line ❸, slip the Viewfinder on as far as the notch ❶ and turn it clockwise.

Preventing Accidental Erasure of Recordings



When recording on a previously recorded tape, the previously recorded contents will be erased and replaced by the new recording. An important recording can be protected against accidental erasure by breaking off the tab. If the tab is removed, recording on this Video Cassette is no longer possible.

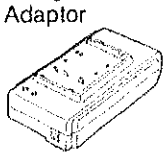
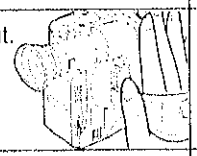
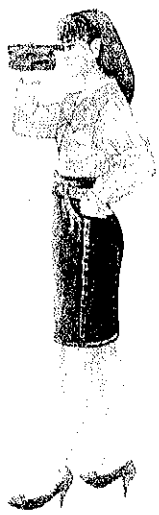
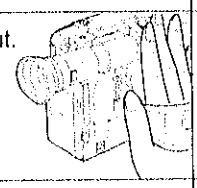
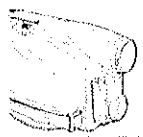
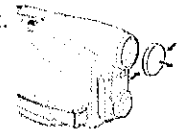
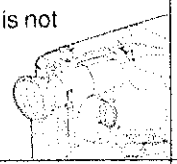
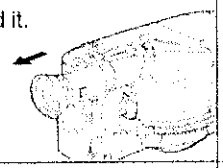
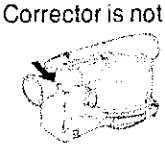
■ To protect important recordings against accidental erasure:

Break off the tab with a screwdriver in the direction of the arrow.

■ Recording onto a Video Cassette with a Missing safety tab:

Cover the hole firmly with two layers of Adhesive Tape.

Before Requesting Service

	Item	Symptom	Cause	Action	Reference page
Power	Using the Battery Pack	•Movie Camera does not turn on.	•Not attached.	•Attach it correctly.	8
			•Not charged.	•Charge it.	8
		•Movie Camera turns off too soon.	•Exhausted.	•Use a fully charged one.	8
			•Filming was paused for more than 6 minutes.	•Turn the [POWER] ON/OFF Switch in to turn off the Movie Camera, and then turn it out again to turn on the Movie Camera.	15
	Using the AC Adaptor 	•Movie Camera does not turn on.	•Not connected.	•Connect it correctly.	6
	Using any of the power sources	•Movie Camera does not turn on.	•[POWER] ON/OFF Switch is not turned out.	•Turn it out. 	10
		•Movie Camera turns off too soon.	•Condensation has formed inside.	•Wait several hours.	42
Filming		•No picture in the Viewfinder.	•[POWER] ON/OFF Switch is not turned out.	•Turn it out. 	10
			•Lens Cap is attached. 	•Remove it. 	10
		•Indications in the Viewfinder are not clear.	•Viewfinder is not extended. 	•Extend it. 	10
			•Eyepiece Corrector is not adjusted. 	•Adjust it.	10
			•Lens is dirty.	•Clean it.	39

Item	Symptom	Cause	Action	Reference page
Filming	• Filming cannot be started.	• The erasure prevention tab of the inserted cassette is broken off.	• Cover the tab hole with adhesive tape.	39
		• No cassette is inserted.	• Insert a cassette with intact erasure prevention tab.	10
		• Tape has reached its end.	• Insert a new one.	10
	• Some noise from the zoom operation is picked up.	• The surroundings are very quiet.	• It is not a malfunction.	—
	• Date and time cannot be recorded.	• Date and time are not set.	• Set the date and time.	12
	• Date and time are not displayed in the Viewfinder.	• [DATE/TIME] Button was not pressed.	• Press the [DATE/TIME] Button.	12
		• Built-in Lithium Battery is exhausted.	• Recharge the Built-in Lithium Battery.	13
	• "U11/ ⊠ " appears in the Viewfinder.	• The video heads are dirty.	• Return the Movie Camera to a qualified service personnel.	—
Playback (picture)	• No picture.	• [POWER] ON/OFF Switch is not turned out.	• Turn the switch out and press the [VTR/ CAMERA] Button so that the "VTR" Indication Lamp lights up.	22
		• Not connected or incorrectly connected to TV set.	• Connect correctly.	6
		• Wrong channel is selected on TV set.	• Select the correct channel.	—
	• Picture is distorted or not in colour.	• Tracking is not adjusted.	• Adjust the tracking.	30
	• Picture contains noise bars.	• Cue, Review or Still Playback is activated.	• It is not a malfunction.	23

Cautions

In case of abnormal operation of this unit (e.g. if it emits smoke or some unusual smell), immediately stop the operation and consult qualified service personnel.

■ Cautions for Use of the Movie Camera

- When a thunderstorm approaches, stop using it. (If the AC Adaptor is being used, disconnect it from the mains outlet.)
- Do not aim the Lens at the sun. (This could damage internal parts of the Movie Camera.)
- Do not use it in the water or in places where water or some other liquid could splash on it. (If it is accidentally dropped into water while the AC Adaptor is being used, disconnect it from the mains outlet.)
- Do not use it with the cassette compartment facing down. (This could cause uneven winding of the tape.)
- Do not insert or remove the video cassette in dusty places.
- Do not use the Viewfinder as a carrying handle when transporting the Movie Camera.
- Do not disassemble or reconstruct it.
- Do not subject it to strong vibrations or shocks. Handle it with care to prevent accidentally dropping it.
- Do not insert any foreign objects into the Movie Camera nor spill water into it.
- Do not use it in areas with strong electric fields. (This could negatively influence the picture quality.)
- Do not operate it near a TV set or a radio. (This could distort the picture and sound reception.)
- Do not use it in places with steam or oily smoke.
- When unplugging the mains cable, pull it by the plug, not by the cable.

■ Cautions for Cleaning the Movie Camera

- Do not use benzine, thinner or other chemicals for cleaning, because they could change the colour and damage the surface of the camera body.
- When using a chemically treated cloth for cleaning, carefully follow the instructions for its use.
- Wipe the Movie Camera with a clean, dry cloth. Never use cleaning fluid or other chemicals.
- Clean the lens only with a blower brush (used for photo cameras) or special lens cleaning tissue (used for glasses and cameras).

■ Cautions for Storage

- Do not store this Movie Camera in the following places.
  Places exposed to direct sunlight.
  Places with high temperature and high humidity (e.g. in a closed car or in a bathroom).
  Near heaters.
- Do not leave it in direct contact with rubber or plastic products for a long time.
- Keep it out of reach of children.

■ Cautions for Transport

- When not actually filming, carry it in a specially designed Carrying Case.
- Keep the packing materials. When transporting it in the future, pack it in the same way as you purchased it.

Condensation

If Condensation Has Formed Inside the Movie Camera, Filming is Not Possible.

■ Symptoms of Condensation

- If the following symptoms occur, condensation has formed inside the Movie Camera.
  ❶ The Condensation Indication in the Viewfinder flashes.
  (After this indication flashes for a few seconds, the Movie Camera will automatically turn itself off again.)
  ❷ When turning on the Movie Camera, it turns itself off.
  (However, the Movie Camera also turns itself off when the Battery Pack is exhausted.)

■ Remedy

- Wait a few hours before operating the Movie Camera again.
  (The actual time depends on the surrounding conditions.)
- Turn on the Movie Camera.
- Confirm that the Condensation Indication is not displayed any more.
- For added safety, wait about 1 more hour.

■ Remarks about Condensation

- Condensation can form if the Movie Camera is suddenly brought from cold surroundings to a place where it is hot or humid.
- Since condensation forms gradually, there may already be some condensation inside the Movie Camera even before the Condensation Indication begins to flash.
- In an extremely cold place, condensation may freeze and turn into frost. As the Movie Camera cannot detect frost, the Condensation Indication does not appear until the frost melts.

■ Precautions against Condensation

When moving it from a very cold place to a very warm place, keep it in a tightly closed plastic bag or similar to prevent condensation from forming.

Questions & Answers

1 Power Sources

Q: What types of power sources can be used for this Movie Camera? And how are they used?

A: There are basically the following 3 different power sources.

1) Battery Pack: Use it when filming outdoors and indoors, when there is no mains socket available.
2) AC Adaptor: Use it to connect the Movie Camera to a mains socket when filming indoors or near a mains socket outdoors.
   It can also be used to save Battery Pack power when setting the time and date of the built-in clock, or when trying out some camera functions.
3) Car Battery Cord: Use the Car Battery Cord (optional) to connect the Movie Camera to the cigarette lighter socket in a car or other vehicle.

Q: Why aren't the Battery Packs sold in charged condition?

A: Ni-Cd (Nickel-Cadmium) Battery Packs or Ni-MH (Nickel-Metal-Hydride) Battery Packs can be used with this Movie Camera. Both types are subject to self-discharging, i.e. their capacity will decrease gradually when they are left unused after charging. In one month, the capacity decreases by approx. 20%. Therefore, to ensure that you have the maximum charge available for filming, be sure to charge the Battery Packs no more than a few days before using them.

Q: Even though I charged the Battery Pack, its operation time is much shorter than indicated. Why is that?

A: This may be due to one of the following reasons:

1) The maximum operation time of the Battery Pack listed in the Operating Instructions is for continuous filming at an ambient temperature of 20°C. However, the use of the zoom and other functions increases the power consumption, so that the actual recording time per Battery Pack is 30%–50% less than for continuous filming.
2) The Battery Pack is used at the place with low temperature e.g. a ski slope.
   The useful operation time of the Battery Pack becomes shorter as the ambient temperature gets lower. When you film on a ski slope, for example, it may be possible to film no longer than 5 minutes, even when you use a fully charged Battery Pack. Therefore, it is recommended that you take along 3–5 times as many charged Battery Packs as you would for filming at normal temperature. Also, using large-capacity Battery Packs will give you double the uninterrupted filming time of normal ones.

Q: Are there any ways to refresh a Battery pack if its useful operation time has become very short?

A: Refreshing Battery Packs is possible with the following procedures:
Continue charging the Battery Pack for an additional 24 hours after the Charge Indication Lamp on the AC Adaptor goes out. However, if the useful operation time is still too short for normal use, even after this procedure, the service life of the Battery Pack has reached its end.

Q: How often can a Battery Pack be recharged?

A: Approx. 200 times.

Q: How can one distinguish charged from discharged Battery Packs?

A: There is no difference in appearance. Therefore, it is recommended to make use of the Charge Confirmation Marker on the Battery Pack.
For example, slide the marker so that the red dot is visible for a charged Battery Packs, and slide it the other way so that the red dot is not visible for partially or completely discharged Battery Packs.

Q: Are there any points to observe for effective use of the Battery Pack?

A: Observe the following points faithfully.

1) Charge the Battery Pack immediately before use or on the day before.
2) When you have finished the filming of a scene, turn the Movie Camera off.
3) Since the operation time of the Battery Pack becomes shorter at low ambient temperature, wrap the Movie Camera with a towel or blanket so that it does not get cold when carrying it outside.
4) When the Battery Pack is not being used, remove it from the Movie Camera and store it in a cool place. If you leave the Battery Pack attached to the Movie Camera for a very long period of time, excessive discharging may occur, and it may not be possible to use that Battery Pack again.
5) When carrying or storing the Battery Pack, ensure that no metal objects e.g. keys, etc. touch the connectors of the Battery Pack.

Q: After turning on the Movie Camera, the [CAMERA] Indication Lamp flashes and the Movie Camera turns itself off immediately.

A: This may be due to one of the following reasons:

1) The Battery Pack is completely discharged.
2) Condensation has formed inside the Movie Camera.

Q: About 6 minutes after turning on the Movie Camera, it turns itself off again...

A: If the Movie Camera is left in the Filming Pause Mode (PAUSE) for more than 6 minutes, it will automatically turn itself off to protect the video tape.
Turn it on again to start filming.
(The Movie Camera turns itself off, even if no video cassette is inserted.)

Q: Can the AC Adaptor be used in any country?

A: Yes. It can be used all over the world.
The AC Adaptor adjusts automatically to the local voltage (100 V, 120 V, 220 V or 240 V). (However, since the shape of the mains socket differs almost from country to country, mains adaptor plugs are necessary. Before travelling abroad, confirm what type of mains socket is used in the country of your destination and take along the matching adaptor plug.)

2 Video Cassettes

Q: What kind of video cassettes can be used in this Movie Camera?

A: All video cassettes carrying the "VHS [C]" or "S-VHS [C]" logo mark can be used.
[C] stands for "Compact".

Q: What is the difference between "VHS" and "S-VHS" video cassettes? Are they compatible?

A: "VHS" stands for Video Home System. "S-VHS" stands for Super Video Home System. The S-VHS system was developed based on the VHS system to provide enhanced picture resolution and higher overall picture quality. For this reason, it is named "Super".
When recording (filming) in the S-VHS system, these recordings can only be played back on equipment carrying the "S-VHS" or "SQPB" logo mark.

Cassette	Equipment for Recording		Recording System	Equipment for Playback		Playback System
VHS	VHS S-VHS	Movie Camera or VTR	VHS	VHS S-VHS	Movie Camera or VTR	VHS
S-VHS	VHS		VHS	VHS		VHS
	S-VHS		S-VHS	S-VHS SQPB		S-VHS

Q: Is it possible to record on both sides of a video tape?

A: No. Video cassettes can only be recorded on one side.
Therefore, there is only one way in which video cassettes can be inserted into the Movie Camera or a VTR. Insert it in the direction indicated by the arrow on the video cassette.

Q: How often can a video cassette be used?

A: In normal use approx. 100 times.

Q: Does removing the video cassette in bright daylight erase part of the recording?

A: No. Video cassettes contain magnetic tape, and light does not negatively influence it.

Q: Does the security scanning equipment at airports damage video cassettes?

A: No.

Q: Is there any way to protect important recordings against accidental erasure by recording again on a previously recorded tape?

A: If the tab of a video cassette is broken out, it cannot be recorded any more.
However, when you want to record again on that video cassette, firmly cover the hole where the tab was with two layers of adhesive tape.

Q: What do SP and LP stand for?

A: "SP" stands for Standard Play. Filming and playback are possible for the duration indicated on the video cassette.
"LP" stands for Long Play. Filming and playback are possible for approx. double the duration indicated on the video cassette. While it is more economical, the picture quality is slightly inferior to that of the SP mode.
(For example, on a video cassette NV-EC45XG, recording is possible for 45 minutes in the SP mode and for 90 minutes in the LP mode.)

Q: What precautions must be observed for handling video cassettes?

A: Special attention should be paid to the following points:

1) Before inserting a video cassette into the Movie Camera, make sure that the tape is tight. If it is loose, turn the cog wheel to tighten it.
2) After filming, remove the video cassette from the Movie Camera, put it back into its case and store it in vertical position. Stacking the video cassettes could deform them and damage the edges of the tape.
3) Since the video cassettes are easily affected by dust, high humidity and high temperature, store them in a cool place that is not exposed to direct sunlight.
4) Do not place them near electronic equipment with a strong magnetic field.
5) Be sure to fully rewind the tape to its beginning before storing the video cassette.
6) Expose the tape to air by fast-forwarding and then rewinding it once a year.

Questions & Answers (cont.)

3 Filming

Q: Is it possible to film at night or in a dimly lit room?

A: At the light of at least one candle, filming is still possible.
In the specifications, the minimum required illumination is listed as 1 lux. As a rough estimate, at a distance of 30 cm, the light cast by a burning candle is 7 lux. Since the minimum required illumination is lower than this, filming is possible.
(To brighten up a dark scene, use the Low Light Mode.)

Q: What precautions must be observed for filming performances on a stage?

A: A subject that is brightly lit by spot-lights surrounded by dark parts of the stage or hall may result in excessive contrast and cause the subject to appear whitish in the playback picture. To prevent this, zoom in on the subject so that the brightly lit area fills most of the picture.

Q: Even though the scene was brightly lit, the subject's face appears too dark in the playback picture. How can I prevent this?

A: This may be due to the following reasons:

1) When filming backlit scenes:
   It is a basic rule to film your subjects with the sun in your back, just like for taking photos. Also zoom in on the subject so that strong light sources are no longer close to the subject in the picture, and then start filming. Be careful when filming outside from inside a room, because the same phenomenon could occur. In some situations, using the Video DC Light (optional) may help to brighten up the subject.
2) The surroundings are too bright. When filming on a beach in summer or on a ski slope, the light may be too strong because of the added light reflection from the water, sand or snow, causing the subject to appear dark in the playback picture. Zoom in on the subject so that strong light sources are no longer close to the subject in the picture, and then start filming.

Q: What precautions must be observed for filming on a beach?

A: Pay attention to the following 4 points:

1) Splashing Sea Water
   Water, especially saltwater, splashing on the Movie Camera may cause mold. Take care that no water splashes onto the camera. If saltwater has splashed on it, or if it was exposed to a sea breeze (containing salt), wipe it with a clean, damp cloth after filming.
2) Sand (Dust)
   Take great care that fine sand does not enter the Movie Camera, as it can cause serious malfunction. Also, do not insert or remove the video cassette in places with much dust.
3) Heat (High temperature)
   Almost the entire body of the Movie Camera is black. If it is exposed to direct sunlight for a long time, the temperature inside it will rise excessively and cause malfunction.
4) Light (Too Bright)
   The reflection of light on a beach in summer is much stronger than may be realized. Just as you can see much more comfortably under such conditions if you wear sunglasses, the pictures filmed with an ND Filter attached to the lens will be much more comfortable to watch.
   "ND" stands for Neutral Density, and this filter reduces strong light in a similar way as sunglasses, but without tinting the picture brown.

Q: While filming with the Movie Camera, is it possible to monitor the picture on a TV set?

A: Yes. Simply use an Audio/Video Cable to connect the Video Output Socket of the Movie Camera with the Video Input Socket of a VTR or of a TV set and select the video playback channel on the TV set.

Q: Is it possible to film without sound?

A: If the Movie Camera is equipped with a socket for connecting an external microphone, insert an M3 type plug (that is not connected to anything) into the socket. This deactivates the built-in microphone.

Q: What precautions must be observed for filming in a cold place, for example on a ski slope?

A: Pay attention to the following points.

1) Protection against Water (Snow)
   Take care that the Movie Camera does not get wet with snow.
   Even if only very little snow is left on the Movie Camera, it may melt and flow inside. Therefore, prepare a plastic bag, some other waterproof bag or a towel or small blanket. After filming, wrap the Movie Camera with a towel or blanket etc. and put it into the plastic bag.
2) Protection against Cold (Low temperature)
   The temperature range for normal operation of the Movie Camera is 0°C–40°C. The colder the ambient temperature becomes, the shorter becomes the operation time of the Battery Pack. Be sure to take along extra Battery Packs. After use, wrap the Movie Camera with a towel or blanket, etc. to keep it warm.
3) Strong Light (Too bright)
   On a ski slope, the direct sunlight and the light reflected by the snow surface is surprisingly strong.
   As the iris automatically adjusts to the white snow, the people and their colourful ski wear will appear too dark in the playback picture.
   To prevent this, zoom in on the subject so it occupies as much as possible of the picture, or use an ND Filter (optional).
4) Condensation (When the Movie Camera is brought from cold surroundings into a warm room)
   When you bring the Movie Camera from a ski slope, etc. into a warm room, condensation will form inside the Movie Camera and the video cassette. This is the biggest danger to the proper functioning of the Movie Camera. If the Condensation Indication appears in the Viewfinder, filming is no longer possible. Immediately take out the video cassette and turn the Movie Camera off. Wait for the Movie Camera to warm up and turn it on about once an hour to check if the Condensation Indication is still visible. It may take several hours before this indication disappears and filming can be resumed.
   To prevent condensation from forming, wrap the Movie Camera with a towel or small blanket to prevent it from getting cold during filming.
   Before taking the Movie Camera into a warm room, put it into a plastic bag and close it tightly. Do not take it out of the bag for at least one hour, so that it can slowly acclimatise to the room temperature.

4 Playback

Q: When on holidays in a foreign country, can I play back the recordings made with this Movie Camera via a TV set in that country.

A: Basically, there are 3 different television systems used in the world. If the TV set uses the same television system as this Movie Camera (PAL), it can be used for playback.

1) PAL (Great Britain, Germany, Australia, Holland, Italy, Spain, China, etc.)
2) SECAM (France, Greece, Iran, Russia, etc.)
3) NTSC (USA, Canada, Japan, Korea, Philippines, etc.)

Q: When playing back on a VTR a video cassette recorded with this Movie Camera, some noise bars appear in the picture. How can I eliminate them?

A: The tracking of the two units is not precisely matched.
Eliminate the noise bars by adjusting with the tracking control on the VTR.
When filming and playback are performed with the same Movie Camera, the tracking will match precisely.

Q: The Movie Camera is connected to the TV. However, no playback picture appears on the TV screen...?

A: Select the video playback channel on the TV set.

Q: The red lever on the side of the Cassette Adaptor stands out and prevents inserting the Cassette Adaptor into the VTR...?

A: Insert a battery (R6) into the Cassette Adaptor. If the battery is exhausted, replace it with a new one.

Index

A

AC Adaptor (p. 6, 8)
AC Mains Cable (p. 6, 8)
[AE] Selector (p. 15, 26, 28)
[AUDIO OUT] Socket (p. 6)
Auto Focus Mode (p. 26)
Auto Mode (p. 14)

B

[BATTERY EJECT] Button (p. 9)
Battery Pack (p. 8)
Before Requesting Service (p. 40)
Built-in Lithium Battery (p. 13)

C

"CAMERA" Indication Lamp (p. 10)
Camera Search Function (p. 30)
Car Battery Cord (p. 34)
Cassette Adaptor (p. 24)
Cassette Compartment [LOCK] Button (p. 11)
"CHARGE" Lamp (p. 8)
Checking the End of a Recorded Scene (p. 30)
"CHK" Indication (p. 30)
Condensation (p. 42)
Cue Playback (p. 22)

D

[DATE/TIME] Button (p. 12)
Date/Time Setting (p. 12)
[DC IN] Socket (p. 6)

E

[EDIT] Socket (p. 35)
[▲ EJECT] Lever (p. 10)
Error Code (p. 19)
Eyecup (p. 39)
Eyepiece Corrector Ring (p. 11)

F

FF (Fast-Forward) (p. 22)
Filming Start/Stop Button (p. 14)
[FOCUS] Button (p. 26)
Focus Ring (p. 26)

G

Grip Belt (p. 38)

H

Head Clogging (p. 41)

I

Index signal (p. 15)
Infra-Red Sensor (p. 4)

L

Lens Cap (p. 10, 38)
Low Light Mode (p. 28)

M

Manual Focus Mode (p. 26)
Max. Filming Time with Battery Pack (p. 9)
[MEMORY] Button (p. 16)

O

Optional Accessories (p. 37)

P

[PAUSE] Button (p. 23)
[PLAY] Button (p. 23)
Portrait Mode (p. 28)
[POWER] ON/OFF Switch (p. 10)

R

Rec Check (p. 30)
Remaining Tape Time (p. 16)
[RESET] Button (p. 17)
REW (Rewind) (p. 22)
Review Playback (p. 22)
[RF DC OUT] Socket (p. 5)

S

Shoulder Strap Holders (p. 38)
[SP/LP] Button (p. 14)
Sports Mode (p. 28)
Standard Accessories (p. 3)
Still Playback (p. 23)
[STOP] Button (p. 23)

T

[TAPE] Button (p. 16)
Tape Counter (p. 16)
Tape Length (p. 16)
Tripod Receptacle (p. 5)
Tracking Adjustment (p. 30)

V

Viewfinder (p. 18)
[VIDEO OUT] Socket (p. 6)
VISS (p. 15)
"VTR" Indication Lamp (p. 22)

W

Warning/Alarm Indications (p. 18)
[W • T] Zoom Lever (p. 14)
White Balance Adjustment (p. 32)

Z

Zoom (p. 14)
Zoom magnification (p. 14)

Specifications

VHS-C Movie Camera

Information for your safety

Power Source:	4.8 V (Battery Pack) 6.0 V (AC Adaptor)
Power Consumption:	5.4 W (Battery Pack Operation)

- The rating plate is on the bottom side of the Movie Camera.

Video Recording System:	Rotary four heads, helical scanning system
Tape Speed:	SP; 23.39 mm/s LP; 11.7 mm/s
Tape Format:	VHS-C tape
Recording/Playback Time:	SP; 45 min. with NV-EC45XG LP; 90 min. with NV-EC45XG

VIDEO

Television System:	CCIR; 625 lines, 50 fields PAL colour signal
Modulation System:	Luminance; FM azimuth recording Colour signal; Converted subcarrier phase shift recording
Output Level:	VIDEO OUT (PHONO); 1.0 Vp-p, 75 ohm unbalanced

AUDIO

Output Level:	AUDIO OUT (PHONO); −6 dB, 47 kohm loaded
Audio Track:	1 track (Normal—Monaural)
Image Sensor:	¼-inch CCD Image Sensor
Lens:	10:1 Variable Speed Power Zoom Lens with Digital AI Auto Focus Focal Length; 4.6–46 mm F1.8 Auto Iris Filter Diameter 37 mm
Viewfinder:	0.5-inch Electronic Viewfinder
Standard Illumination:	1,400 lux
Minimum Required Illumination:	1 Lux (Low Light Mode)
Video Horizontal Resolution:	More than 230 lines (SP)
Signal-to-Noise Ratio:	Video; More than 40 dB (SP) Audio; More than 41 dB
Audio Frequency Response:	80–8,000 Hz (SP)
Operating Temperature:	0°C–40°C
Operating Humidity:	10%–80%
Weight:	Approx. 690 g (without Battery Pack)
Dimensions:	Approx. 86 (W)×118 (H)×242 (D) mm

AC Adaptor

Information for your safety

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	25 W
DC Output:	DC 6.0 V, 8.5 W (Movie Camera Operation) DC 4.8 V, 1.2 A (Battery Pack Charging)

- The rating plate is on the bottom side of the AC Adaptor.

Weight:	Approx. 210 g (without AC Cable)
Dimensions:	Approx. 72 (W)×39 (H)×143 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

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